SEM
committee

Single Electricity Market
(SEM)

Capacity Remuneration Mechanism
2025/26 T-4 Capacity Auction Parameters

Consultation Paper
SEM-21-059

03 August 2021

1. EXECUTIVE SUMMARY

Under the revised SEM arrangements, implemented in October 2018, capacity revenues are allocated by capacity auction for a relevant capacity year. Prior to each capacity auction, a number of capacity auction parameters must be set. The list of parameters to be determined by the Regulatory Authorities is described in paragraph D.3.1.3 of the Capacity Market Code.

This paper describes the SEM Committee's proposals for the relevant parameters to apply in the 2025/26 T-4 Capacity Auction, scheduled to take place in March 2022.

Most of the parameters proposed are the same as those used in recent auctions, including the 2024/25 T-4 auction. The SEM Committee proposes to change the shape of the demand curve that is used in the auction and propose an increase in Performance Security Posting and Termination Charges, and seek responses on these, along with preferred choice on two options relating to the way that the De-Rating factors are calculated for New Capacity.

The proposed parameters for consultation are:

Parameter	Proposed Value for 2025/26 T-4 capacity auction
De-Rating Curves, defining De-Rating Factors by unit Initial Capacity and by Technology Class (including for Interconnectors)	To be frozen at the same values used for the 2024/25 T-4, pending a more detailed review of derating factors. May include a new de-rating factors for Annual Run Hours Limited (ARHL) plant.
Capacity Requirement	To be determined by System Operators prior to publication of Initial Auction Information Pack.
Indicative Demand Curve	The Demand Curve shape will be chosen once the views of industry are known, and the SEM Committee have made their response.

Auction Price Cap	1.5 times Net CONE i.e. €138,450 / de-rated MW / year, subject to considerations around an ARHL Derating Factor.
Existing Capacity Price Cap	0.5 x Net CONE i.e. €46,150 / de-rated MW /year, subject to considerations around an ARHL Derating Factor.
New Capacity Investment Rate Threshold	€300,000 /de-rated MW / year.
Annual Stop Loss Limit Factor	1.5
Billing Period Stop Loss Factor	0.5
Indicative Annual Capacity Exchange Rate	To be determined by System Operators prior to publication of Initial Auction Information Pack.
Increase Tolerance and Decrease Tolerance by Technology Class	<table><tr><th>Technology Class</th><th>Increase Tolerance (%)</th><th>Decrease Tolerance (%)</th></tr><tr><td>All Except DSUs</td><td>0</td><td>0</td></tr><tr><td>DSUs</td><td>0</td><td>100</td></tr></table>
	<table><tr><th>Date / Event</th><th>Performance Security Rate (€/MW)</th></tr><tr><td>From Capacity Auction completion to 24 months prior to the beginning of the Capacity Year</td><td>10,000</td></tr></table>

Performance Security Posting Dates / Events	24-13 months prior to the beginning of the Capacity Year	20,000
	From 13 months to beginning of Capacity Year	30,000
	From beginning of Capacity Year	40,000

	Date / Event	Termination Charge Rate (€/MW)
Termination Charges	From Capacity Auction completion to 24 months prior to the beginning of the Capacity Year	10,000
	24-13 months prior to the beginning of the Capacity Year	20,000
	From 13 months to beginning of Capacity Year	30,000
	From beginning of Capacity Year	40,000

Full Administered Scarcity Price and Reserve Scarcity Price Curve		
	Short Term Reserve (MW)	**Administered Scarcity Price (€/MWh)**
	Demand Control	25% of VOLL
	0	25% of VOLL
	500	DSU Theoretical Price
Anticipated values to be applied in determining the Strike Price	Current values to be re-applied.	

Responses to the proposals within this consultation should be sent to Kevin Baron (Kevin.Baron@uregni.gov.uk) and Billy Walker (Billy.Walker@uregni.gov.uk) by 27 August 2021. We intend to publish all responses unless they have been marked as confidential.

2. CONTENTS

3.   INTRODUCTION AND BACKGROUND

The SEM Capacity Remuneration Mechanism ("**CRM**") was developed through an extensive series of consultation and decision papers. The CRM allocates capacity payments through ex-ante capacity auctions.

Before each capacity auction, the Capacity Market Code ("**CMC**") requires a number of auction parameters to be determined by the Regulatory Authorities ("**RAs**" (the Utility Regulator in Northern Ireland and the Commission for Regulation of Utilities ("**CRU**") in Ireland).

Parameters to be determined

Paragraph D.3.1.3 of the CMC requires the Regulatory Authorities to determine the following parameters for each Capacity Auction, and provide them to the System Operators for inclusion in the applicable Initial Auction Information Pack:

(a)   the De-Rating Curves, defining De-Rating Factors by Technology Class (including for Interconnectors);

(b)   the Capacity Requirement;

(c)   an indicative Demand Curve;

(d)   the Auction Price Cap;

(e)   the Existing Capacity Price Cap;

(f)   the €/MW rate of the New Capacity Investment Rate Threshold;

(g)   the Annual Stop-Loss Limit Factor;

(h)   the Billing Period Stop-Loss Limit Factor;

(i)   the indicative Annual Capacity Payment Exchange Rate;

(j)   the Increase Tolerance and Decrease Tolerance by Tolerance Class that may be applied by a Participant in its Application for Qualification to Capacity Market Unit de-ratings;

(k)   in respect of Performance Securities:

(i) the final Performance Security Posting Dates/ Events applicable to Awarded Capacity allocated in the Capacity Auction; and

(ii) for each Performance Security Posting Date/ Event, the final €/MW rate to be applied in setting Performance Securities applicable to Awarded Capacity allocated in the Capacity Auction;

(l) the €/MW fee rates for calculating Termination Charges;

(m) values for the Full Administered Scarcity Price and the Reserve Scarcity Price; and

(n) anticipated values for the parameters to be applied in determining the Strike Price.

There is one other issue relevant to the functioning of the 2025/26 T-4 auction which is covered by this consultation in regards to the treatment of constraints.

4. PARAMETERS REQUIRED BY THE CAPACITY MARKET CODE

As described, the Regulatory Authorities must determine the following parameters:

(a) the De-Rating Curves, defining De-Rating Factors by Technology Class (including for Interconnectors);

A De-Rating Curve is a curve for a Technology Class that represents the De-Rating Factor applicable by unit Initial Capacity and Initial Maximum On Time to be used in a Capacity Auction. A De-Rating Factor describes the proportion of Initial Capacity of a Generator Unit or Interconnector that can contribute towards satisfying the Capacity Requirement to be used in a Capacity Auction.

The System Operators published a methodology for the Calculation of Capacity Requirement and De-rating factors prior to the 2019/20 T-1 capacity auction[1]. This is a least-worst regrets analysis which selects the demand forecast level to be used for the Capacity Market auction. The De-Rating Factors are those that are used to derive the Capacity Requirement selected by the least-worst regrets analysis.

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[1]SEM-18-030a: https://www.semcommittee.com/news-centre/i-sem-crm-t-1-cy201920-capacity-auction-parameters-and-enduring-de-rating-methodology

As set out in SEM-21-025, the SEM Committee has concerns with some aspects of the existing methodology and assumptions used to calculate some of the De-Rating Factors. For that reason, the SEM Committee decided to:

- Freeze the Derating Factors Retain the DRFs used for the T-4 2024/25 auction for the T-1 2022-23 auction;

- Instigate a review into the DRF methodology and assumptions, and

- Incorporate learnings from this review into the DRF settings as soon as reasonably practicable.

In SEM-21-058 the SEM Committee decided to freeze the Derating Factors for the 2024/25 T-3 auction too. There is a limit to feasible changes to the derating methodology and models in time for the issue of the 2025/26 T-4 auction, so the SEM Committee is considering continuing to freeze the values for the 2025/26 T-4 Auction auction as well. The SEM Committee may make some adjustments as necessary to the Demand Curve and Local Capacity Constraint Area volumes in the Final Auction Information Pack to ensure that the freezing of the derated factors does not have a detrimental effect on the security of supply standard.

In SEM-21-054, the SEM Committee consulted on the potential to include an additional Annual Run-Hour Limitation (ARHL) Derating Factor in the 2024/25 T-3 and the 2025/26 T-4 auction. As set out in SEM-21-058, the SEM Committee decided against intervening for this T-3 24/25 Auction, and will look to incorporate new learning and work with key stakeholder for a solution to this problem in time for the T-4 25/26 Auction. A separate decision paper on this will be published in due course.

(b)   the Capacity Requirement;

The Capacity Requirement is the de-rated capacity required to satisfy the SEM Security Standard for a specific Capacity Year to be used in a Capacity Auction. The SEM Security Standard is the standard specified by the Regulatory Authorities for the annual loss of load expectation to be maintained in the SEM, i.e. the number of hours per year for which load curtailment may occur due to demand exceeding available capacity. In CRM Detailed Design Decision 1[2] the SEM Committee decided to retain the security standard at 8 hours LOLE.

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[2] SEM-15-103, section 2.2.16

The System Operators published a methodology for the Calculation of Capacity Requirement and De-rating factors prior to the 2019/20 T-1 capacity auction.

This methodology will be followed by in determining the Capacity Requirement for the 2025/26 T-4 capacity auction. This will not necessarily be the same as the Capacity Requirement calculated for the 2024/25 T-4 auction.

(c)   *an indicative Demand Curve;*

The Demand Curve is a curve determined by the Regulatory Authorities representing the deemed per MW value of each level of capacity that could be awarded in the Capacity Auction. The following graph indicates one possible shape for this T-4 auction.

The Demand Curve for the 2025/26 T-4 auction could be set as the following:

- Horizontal at the Auction Price Cap from 0MW to 92.5% of the adjusted Capacity Requirement.

- Slopes down in a straight line to 115% of the adjusted Capacity Requirement. The line passes through the point at where the volume is equal 100% of the adjusted Capacity Requirement and the price equals Net CONE (€92,300 / de-rated MW / year).
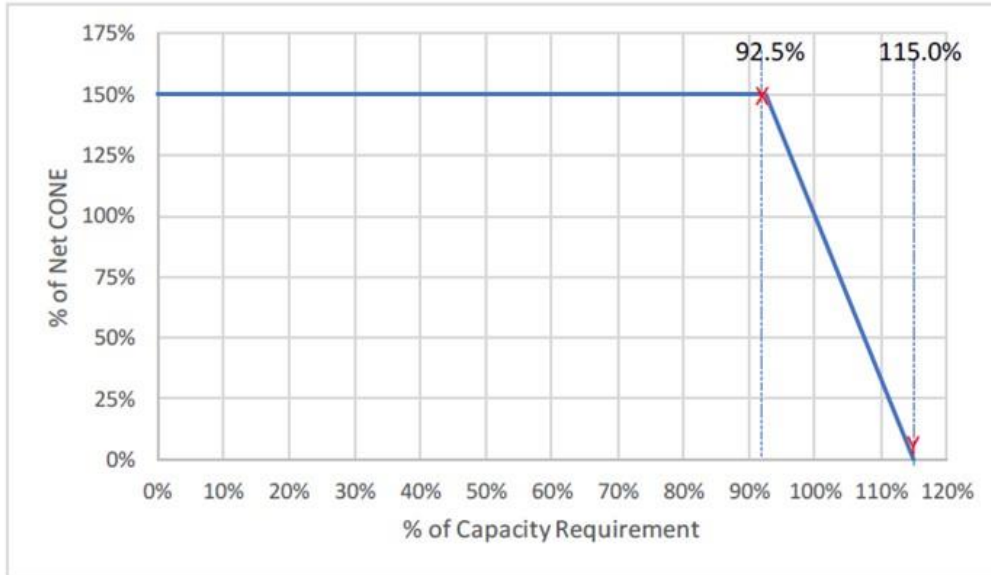
The above curve has the potential to under-procure compared to the adjusted Capacity Requirement, however, any under-procurement in a T-4 auction can be resolved in a subsequent T-1 auction.

As an alternative, the Demand Curve shape could be based on the following:

- Horizontal to 100% of the Capacity Requirement at APC,
- Vertical between APC and net CONE, then
- Sloping down to cross the axis at 115% of the Capacity Requirement.

The demand curve for the auction will also include adjustments for reserves and demand withholding. Decisions on these volumes will be made prior to the publication of the Final Auction Information Pack.

Demand Curve for CY2025/26 T-4 Auction
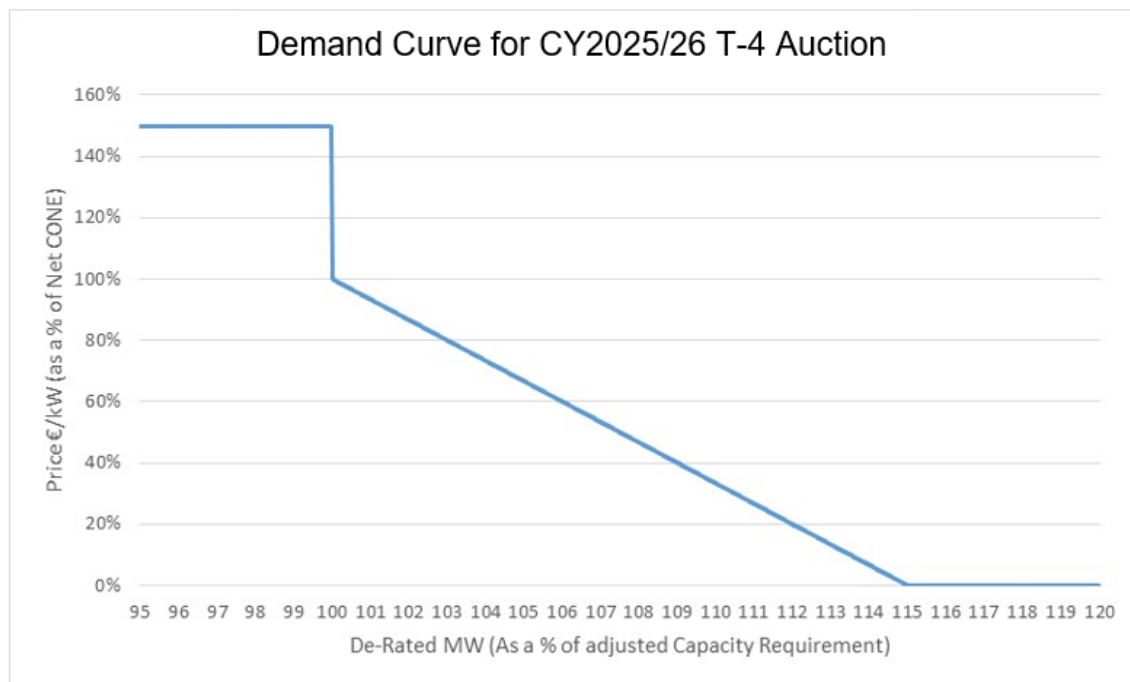
Views are sought on which of the two options above are most appropriate for this auction.

The Capacity Requirement described in part (a) above will be adjusted to account for these volumes. In accordance with paragraph F.3.1.4 of the Capacity Market Code, other adjustments to the Capacity Requirement will include:

a) Capacity already awarded for the 2025/26 Capacity Year in other relevant auctions;

b) an allowance for changes in forecast capacity requirements (as considered appropriate by the Regulatory Authorities);

c) an allowance for capacity to be procured in later auctions for the Capacity Year (as considered appropriate by the Regulatory Authorities); and

d) an allowance for the de-rated value of capacity that is forecast to be operational during the Capacity Year but which will not be participating in the Capacity Auction (as considered appropriate by the Regulatory Authorities).

(d)   the Auction Price Cap;

The Auction Price Cap is the maximum bid price allowed in a Capacity Auction. For all previous auctions, this has been set at 1.5 times Net CONE.

Net CONE is currently €92,300 / de-rated MW / year, as determined in the T-4 CY2022/23 BNE Decision Paper[3].

If the SEM Committee does not introduce an additional ARHL derating factor, the SEM Committee propose to continue to apply a multiplier of 1.5 times Net CONE in setting the Auction Price Cap for the 2025/26 T-4 capacity auction. Auction Price Cap will therefore continue at €138,450 / de-rated MW / year, and the Sterling equivalent using the indicative Annual Capacity Payment Exchange Rate from the Initial Auction Information Pack. However, if an ARHL derating factor is introduced, the SEM Committee will consider whether it is appropriate to make a consequential change to the multiplier and/or Net CONE as a result.

(e) *the Existing Capacity Price Cap;*

The Existing Capacity Price Cap ("**ECPC**") is the price cap applicable to Existing Capacity in a Capacity Auction. It is a uniform non-technology specific cap on the price that Existing Generators and interconnectors can offer volume at, unless they apply to the RAs for a Unit Specific Price Cap ("**USPC**")[4]. New Capacity and DSUs are not subject to the ECPC, and may bid up to the Auction Price Cap.

ECPC performs two key functions:

- Firstly, it limits the ability of generators with market power (but low Net Going Forward Costs ("**NGFCs**")) to exercise their market power through making high offers. Given the significant concerns about market power in the CRM (see SEM-16-010), it is important that the ECPC is not set at a level significantly above where the market is expected to clear in current market conditions.

- Secondly it provides a filter to ensure that only those USPC applications which the RAs need to scrutinise (because they may have a material impact on the clearing price or pay-as-bid prices) are scrutinised. If the ECPC is set too low,

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[3] SEM-18-156
[4] Or submit an Opt-Out Notification on the grounds that they are going to close before the end of the relevant Capacity Year.

then offer prices which are below the clearing price (and therefore will have no impact on the clearing price or pay-as-bid prices) will need to be reviewed, imposing an unnecessary administrative burden on both the RAs and bidders.

In all capacity auctions to date, ECPC has been set at 0.5 times Net CONE. The rationale for this value was:

- It was estimated that the vast majority of plant required to meet the Capacity Requirement could bid at its Net Going Forward Cost without needing to apply for a USPC;

- It is consistent with relevant international benchmarks;

- It strikes an appropriate balance between the objectives of protecting consumers from the potential for bidders to exercise market power, and not placing an excessive workload on market participants and RAs from having to respectively submit and review significant volumes of USPC applications.

Assuming there are no changes to Net CONE resulting from any ARHL Derating Factor, the SEM Committee's proposal is to continue to set the ECPC at 0.5 times Net CONE (€46,150 / de-rated MW / year), and the Sterling equivalent using the indicative Annual Capacity Payment Exchange Rate from the Initial Auction Information Pack. However, if there is any change to Net CONE, the SEM Committee may consider whether to set ECPC at a lower multiple of Net CONE.

Any existing capacity with Net Going Forward Costs higher than the Existing Capacity Price Cap will retain the option to submit a USPC application to the RAs.

(f)   the €/MW rate of the New Capacity Investment Rate Threshold;

The New Capacity Investment Rate Threshold ("**NCIRT**") is an amount determined by the RAs that must be exceeded by the cost per MW of constructing New Capacity for that capacity to be eligible to be allocated Awarded Capacity with a duration of more than one year.

New Capacity is eligible to bid to fix its Reliability Option for up to ten years. In order to do so, a capacity provider must meet a substantial financial commitment threshold. This threshold is known as the NCIRT.

The intention of setting the NCIRT is to ensure that only plant making a substantial financial commitment equivalent to the commitment for a new build plant is able to obtain a multi-year Reliability Option.

Multi-year ROs should not be available to plant making a minor refurbishment. However, the threshold should not penalise investors who are able to build efficiently at low capital cost.

As described in the initial CRM parameters decision paper[5], NCIRT for the first transitional auction was set at approximately 40% of the gross BNE cost, or €300,000 / de-rated MW. The BNE was re-evaluated in 2018 for the 2022/23 T-4 capacity auction. However, there was insufficient evidence to support a change in the NCIRT[6]. The SEM Committee therefore decided to retain the NCIRT at €300,000 / de-rated MW.

The SEM Committee proposes to retain the value of NCIRT at €300,000 / de-rated MW for the 2025/26 T-4 auction.

(g)   the Annual Stop-Loss Limit Factor

The Annual Stop Loss Limit is the multiplier used to establish the annual stop-loss limit for Non-Performing Difference Charges from a Capacity Market Unit.

A stop-loss is a cap on Reliability Option Difference Payments. Reliability Option Difference Payments are charges that must be paid by a generator during a scarcity event. The purpose of the cap is to limit risk on the generator and improve investability. However, a cap on RODPs means that there will be insufficient money to hedge suppliers, which has to be funded through the socialisation fund.

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[5] SEM-17-022, paragraph 7.2.18
[6] SEM-18-155, CY2022/23 Parameters Decision Paper, paragraph 9.4.3.

The stop-loss limit applies only to uncovered difference payments. It does not apply where the capacity provider has received revenue through the energy market to cover the difference payment.

Consider the example whereby a capacity provider has an annual stop-loss limit of €15,000 on an RO volume of 1MW, with the stop-loss limit based on uncovered difference payments. A RO strike price of €500/MWh is assumed. We also assume that there are two scarcity events, each of which lasts two hours, and during each the Administered Scarcity Price rises to €10,000/MWh.

During the first scarcity event, the generator has sold its 1MW of capacity in the energy market and receives €20,000 for its two hours of production.
Under the Reliability Option, it must pay back €19,000 (2MWh * (€10,000/MWh - €500/MWh)) of this revenue in difference payments, and will therefore have net revenue of €1,000. Because the capacity provider had covered revenue from the energy market, the €19,000 does not count towards the stop-loss limit.

During the second event, the capacity provider was on forced outage, and has not sold any output. In the absence of a stop-loss, the capacity provider would have to pay the €19,000 in difference payments, without having any energy revenue to cover this cost. However, the stop-loss limit means that it only has to pay out up to a maximum of €15,000. There is therefore a €4,000 shortfall in RO difference payments. This shortfall is funded through the socialisation fund.

If the stop-loss had been based on all difference payments, the generator would have paid only €15,000 "stop-loss" on the first event and no payments on the second event. The total shortfall in RO difference payments across both events would be €23,000 instead of €4,000.

The stop-loss limit applies to the annual option fee. To date in the capacity market, the Annual Stop-Loss Limit Factor has been set at 1.5.

The SEM Committee propose to continue to apply an Annual Stop-Loss Limit Factor of 1.5 to Awarded Capacity allocated in the 2025/2026 T-4 auction.

(h)   the Billing Period Stop-Loss Limit Factor;

The Billing Period Stop Loss Limit Factor is a multiplier used to establish the billing period stop-loss limit for Non-Performance Difference Charges from a Capacity Market Unit.

The purpose of stop-loss limits is described above. The purpose of the Billing Period Stop Limit Factor is to limit the level of losses in any one Billing Period (week).

If there were no Billing Period Stop Loss Limit Factor, and there were a number of scarcity events at the start of the Capacity Year so that a capacity provider reached its Annual Stop Loss Limit, that capacity provider would have a reduced incentive to maximise its availability for the remainder of the capacity year.
By limiting the losses that can apply in any one Billing Period, the incentive to remain available for the remainder of the Capacity Year is maximised.

The Billing Period Stop Loss Limit Factor is currently 0.5[7]. The SEM Committee proposes to retain this value for Awarded Capacity allocated in the 2025/26 T-4 capacity auction.

(i)   *the indicative Annual Capacity Payment Exchange Rate;*

The Annual Capacity Payment Exchange Rate is an exchange rate applicable to a Capacity Year which converts the Capacity Payment Price for a Primary Trade or a Secondary Trade from Euros to Sterling. This is determined by the System Operators using a methodology approved by the RAs.

Only the indicative exchange rate is calculated for the Initial Auction Information Pack. This will be calculated immediately prior to its publication. The exchange rate will then be updated for inclusion in the Final Auction Information Pack.

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[7] Note: in the parameters decision paper for the first capacity auction (SEM-17-022), the SEM Committee decided that the Billing Period Stop-Loss Limit should be 50% of the Annual Stop-Loss Limit. Because the Annual Stop-Loss Limit Factor was set to 1.5, the Billing Period Stop-Loss Limit Factor was set to 0.75. However, because of the way the Annual and Billing Period Stop Loss Limit Factors interact within paragraph F.18.3.2 and F.18.3.4 of the Trading and Settlement Code, in order to achieve a relation of 50%, a Billing Period Stop-Loss Limit Factor of 0.5 is required.

(j)   the Increase Tolerance and Decrease Tolerance by Tolerance Class that may be applied by a Participant in its Application for Qualification to Capacity Market Unit de-ratings;

The Increase Tolerance is a percentage upwards tolerance that a Participant is permitted to apply to Capacity Market Unit de-ratings in an Application for Qualification. There may be different Increase Tolerances for different Technology Classes.

A Decrease Tolerance is a percentage downwards tolerance that a Participant is permitted to apply to Capacity market Unit de-ratings in an Application for Qualification. There may be different Decrease Tolerances for different Technology Classes.

CRM Decision 1[8] allowed for the possibility of tolerance bands to be applied to the unit-level De-Rating Factors determined for capacity providers. These tolerance bands would allow some flexibility in the level of participation required from dispatchable plant in the auction. This allowance was made in relation to mandatory participation; although all generators would still be required to participate. It would reflect the fact that not all generators of the same technology class have the same degree of reliability.

In the CRM Capacity Requirement and De-Rating Factor Methodology Decision paper[9], the SEM Committee decided that, with the exception of DSUs, the tolerance bands will be set to zero for the transitional auctions, with the decision to be reviewed for the enduring auctions once the enduring value of Full Administered Scarcity Price has been determined.

The SEM Committee is proposing to retain this decision for the 2025/2026 T-4 auction.

Technology Class	Increase Tolerance (%)	Decrease Tolerance (%)
All Except DSUs	0	0
DSUs	0	100

(k)   in respect of Performance Securities:

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[8] SEM-15-103
[9] SEM-16-082, paragraph 4.5.1

(i)   the final Performance Security Posting Dates/ Events applicable to Awarded Capacity allocated in the Capacity Auction; and

(ii)   for each Performance Security Posting Date/ Event, the final €/MW rate to be applied in setting Performance Securities applicable to Awarded Capacity allocated in the Capacity Auction.

A Performance Security is a security required as a condition of capacity award for Awarded New Capacity that has not reached Substantial Completion.

A Performance Security Posting Date/ Event is a date or event from which a specified €/MW rate shall be applied to Awarded Capacity in setting Performance Securities. There may be multiple different Performance Security Posting Dates/ Events. The Performance Security Posting Dates / Events applicable to Awarded Capacity allocated in a Capacity Auction are determined by the Regulatory Authorities and provided to the System Operators.

In the parameters decision paper for the first capacity auction (SEM-17-022) the SEM Committee decided that all capacity is required to post a Performance Bond to cover 100% of its Termination Fee. The SEM Committee has retained this policy for all auctions except this one for the early Termination Charge which will have an extra milestone added 24-13 months prior to the beginning of the Capacity Year. The 24 months upper limit has been chosen to catch all types of auction, be it a T-1 or out to a T-4. This may have increase the burden on project development however, it may also diversify the type of technology or type project that may wish to partake in a Capacity Auction.

Interested parties are asked to comment in their response, on the amounts the SEM Committee have set with regards to the Performance Security Rate and the Termination Charges (of course the Bond amount should be a one for one to the Termination amount) but also on the milestones, participants are asked to give the SEM Committee their view as to whether the number of milestones is suitable and / or whether m a greater timeframe is required.

Date / Event	Performance Security Rate (€/MW)

From Capacity Auction completion to 24 months prior to the beginning of the Capacity Year	10,000
24-13 months prior to the beginning of the Capacity Year	20,000
From 13 months to beginning of Capacity Year	30,000
From beginning of Capacity Year	40,000

(l)   the €/MW fee rates for calculating Termination Charges

A Termination Charge is a fee payable by a Participant where Awarded New Capacity is terminated.

The CRM detailed design decision paper 2[10] noted that it is important that New Capacity is required to pay a Termination Fee if it fails to deliver capacity. The Termination Fee will be payable if the project:

- fails to deliver the Substantial Financial Completion milestones by the given date; or
- fails to achieve Substantial Completion by the Long Stop Date; or
- submits false or misleading information in the Qualification process.

For all capacity auctions to date, the Termination Charges have been set in accordance with the following table:

Date / Event	Termination Chage Rate (€/MW)
From Capacity Auction completion to 24 months prior to the beginning of the Capacity Year	10,000

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[10] SEM-16-022

24-13 months prior to the beginning of the Capacity Year	20,000
From 13 months to beginning of Capacity Year	30,000
From beginning of Capacity Year	40,000

The SEM Committee seeks feedback on the changes outlined above, and also those of the Performance Security rates.

(m)   values for the Full Administered Scarcity Price and the Reserve Scarcity Price; and

The Administered Scarcity Price ("**ASP**") sets a floor on the Balancing Market price when a scarcity event occurs. The Full Administered Scarcity Price is the maximum value of the Administered Scarcity Price. The Reserve Scarcity Price Curve is a piecewise linear curve defining the relationship between the Reserve Scarcity price and the Short Term Reserve Quantity.

For the first two transitional auctions, Full ASP was set at the day ahead market price cap of €3,000/MWh. For the 2024/25 T-4 auction (held in January 2021), Full ASP was set at 25% of the Value of Lost Load (**"VOLL"**). It has been set at this value for all auctions since.

The SEM Committee proposes to retain setting the value of Full ASP in relation to VOLL. Specifically, Full ASP will be set to 25% of VOLL.

In the second CRM detailed design decision paper[11], the SEM Committee decided that the piece-wise linear function of ASP will be static, and the price from which the function begins will be the Reliability Option Strike Price.

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[11] SEM-16-022, section 6.4

However, the Reliability Option Strike Price is not strictly static. As described below, it is set in relation to monthly carbon, gas and oil prices, but has a floor price equal to the theoretical price of a Demand Side Unit (which in recent years has been set at €500/MWh).

The SEM Committee propose to set the price at which the piece-wise linear function of ASP begins at the floor of the Strike Price, as determined below. The Administered Scarcity Price will therefore be set in accordance with the following table:

Short Term Reserve (MW)	Administered Scarcity Price (€/MWh)
Demand Control	25% of VOLL
0	25% of VOLL
500	RO Strike Price

To clarify, ASP only applies when the available Short Term Reserve is less than the operating reserve requirement. If the operating reserve requirement is only 450MW, and the available Short Term Reserve falls to 490MW, the ASP function does not apply and prices will be market determined.

(n)   anticipated values for the parameters to be applied in determining the Strike Price.

If the Market Reference Price exceeds the Strike Price, holders of Reliability Options must make Difference Payments.

The formula for the calculation of the monthly Strike Price ($PSTR_m$) is contained in the Trading and Settlement Code as follows:

$$PSTR_m = Max\left(\frac{1}{FTHEORYPU_y}\right.$$
$$\times Max\Big(PFUELNG_m + \big(PCARBON_m \times FCARBONING_y\big), PFUELO_m$$
$$\left. + \big(PCARBON_m \times FCARBONIO_y\big)\Big), PTHEORYDSU_y\right)$$

where:

- $FTHEORYPU_y$ is the Peaking Unit Theoretical Efficiency for Capacity Year, y;
- $PFUELNG_m$ is the Natural Gas Fuel Price for Month, m;
- $FCARBONING_y$ is the Natural Gas Carbon Intensity Factor for Capacity Year, y;
- $PFUELO_m$ is the Oil Fuel Price for Month, m;
- $FCARBONIO_y$ is the Oil Carbon Intensity Factor for Capacity Year, y;
- $PCARBON_m$ is the Carbon Price for Month, m; and
- $PTHEORYDSU_y$ is the Demand Side Unit Theoretical Price for Capacity Year, y, d.

This formula bases the Strike Price on the cost of a hypothetical low efficiency peaking unit, and includes a floor price on the strike price at the price of a theoretical demand side unit in €/MWh; this reflects the cost incurred by the DSU is switching off, which may not be related to the cost of energy.

The values of each of these parameters for each capacity auction to date were:

Strike Price Component	Value	Unit
$PCARBON_m$	$PCARBON_m$ Index	€/tCO$_2$e
$PFUELNG_m$	[$PFUELNG_m$ Index (p/therm) x 0.01 (£/p) + $PFUELNG_m$ Transport (£/therm)] x Exchange Rate (€/£) x 9.48 (therm/GJ) x 3.6 (GJ/MWh)	€/MWh
$PFUELO_m$	[$PFUELO_m$ Index ($/t) x Exchange Rate (€/$) + $PFUELO_m$ Transport (€/t)] x 0.025 (t/GJ) x 3.6 (GJ/MWh)	€/MWh
$PCARBON_m$ Index	ICE ECX EUA Futures – EUA - (monthly)[12]	€/tCO2e
$PFUELNG_m$ Index	ICE UK Natural Gas Index (monthly)	p/therm
$PFUELNG_m$ Transport	0.0424[13]	£/therm
$PFUELO_m$ Index	Platt's Forward Curve (monthly) for monthly swap transactions for 1% sulphur free on board (FOB) fuel oil cargoes in North West Europe (NWE) for the relevant month (AAEGR00)	$/t
$PFUELO_m$ Transport	50[14]	€/t
$FTHEORYPU_y$	15	%
$FCARBONING_y$	0.202	tCO2e/MWh
$FCARBONINO_y$	0.277	tCO2e/MWh
$PTHEORYDSU_y$	500	€/MWh
Exchange Rate (€/£)	The Trading Day Exchange Rate as defined in the Trading and Settlement Code	€/£
Exchange Rate (€/$)	The rate set at 17:00 the day before the Trading Day, from the same source as used for the Trading Day Exchange Rate	€/$
therm per GJ	9.48[15]	therm/GJ
LSFO calorific value	0.025[16]	t/GJ

The SEM Committee proposes to retain these parameter values for the CY2025/26 T-4 Auction.

5. AUCTION FORMAT

For the recently completed 2024/25 T-4 auction, which ran on 21 January 2021, Auction Format D was utilised. Auction Format D will also be used for the 2025/2026 T-4 auction.

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[12] The December price for a given year will apply to all months falling within that year.
[13] NI natural gas transport adder used in I-SEM PLEXOS Forecast Model 2016-17.
[14] Based on ROI LSFO transport adder used in I-SEM PLEXOS Forecast Model 2016-17.
[15] I-SEM PLEXOS Forecast Model 2017-17
[16] I-SEM PLEXOS Forecast Model 2016-17

6. TREATMENT OF CONSTRAINTS

For the purposes of a Capacity Auction, a number of Locational Capacity Constraints Areas ("**LCCA**") can be determined by the System Operators. A Locational Capacity Constraint Required Quantity is the minimum de-rated capacity quantity that is required to satisfy the Locational Capacity Constraint.

For all capacity auctions completed ahead of the CY2024/25 T-4 Auction, there were two Level 1 LCCAs (Northern Ireland and Ireland) and one Level 2 LCCA (Greater Dublin, associated with the Ireland Level 1 constraint). A Level 2 LCCA for the rest of Ireland outside Greater Dublin was included for the 2024/25 T-4 auction. The SEM Committee proposes to retain this parameter for the CY2025/2026 T-4 Auction.

The Capacity Auction is initially run on an unconstrained (i.e. location agnostic) basis. If following the initial solution, any of the Locational Capacity Constraints has not been satisfied, additional capacity must be procured[17]. This capacity will be procured on a pay-as-bid basis.

When procuring this additional capacity, New Capacity with an offered capacity duration of more than one year should be excluded. However, if there is insufficient capacity within an LCCA to allow the constraint to be met without it, this new, multi-year, Capacity must be considered.

For the 2025/2026 T-4 capacity auction, the SEM Committee remains open to allowing the constrained element auction to solve using multi-year New Capacity. A decision on this will be made prior to the publication of the Final Auction Information Pack, after the System Operators have provided the relevant information on LCCAs.

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[17] Under Auction Format C and D, this constrained capacity can replace capacity that was used to satisfy the initial solution.

7.   NEXT STEPS

Responses to the proposals within this consultation should be sent to Kevin Baron (Kevin.Baron@uregni.gov.uk) and Billy Walker (Billy.Walker@uregni.gov.uk) by 27 August 2021. We intend to publish all responses unless they have been marked confidential.

A decision on the parameter values will be published in September 2021 and the parameter values included in the Initial Auction Information Pack developed by the System Operators.