Capacity Remuneration Mechanism (CRM)

2028/29 T-4 Auction, Volumes Information Note

SEM-25-019

03 June 2025

Executive Summary

The 2028/29 T-4 auction was held in December 2024. The auction resulted in the procurement of around 606MW$_d$ of New Capacity, and also secured substantial investment in refurbishing 1,646MW$_d$ of existing capacity. The successful refurbishment projects will include a range of benefits, including extending the life of some efficient Combined Cycle Gas Turbine (CCGT) capacity, increasing efficiency and flexibility, and cutting carbon emissions. CCGTs are a lower carbon alternative to building new Open Cycle Gas Turbine capacity, for times when baseload running is required. At this stage of the energy transition, refurbishing existing CCGTs is a lower cost, lower carbon alternative to building new gas turbine capacity. The investment was secured at an average cost below the New Capacity Investment Rate Threshold, of €300,000/MW$_d$, and at a price well below the cost per MW$_d$/yr of new capacity.

The primary objective of the CRM is to ensure security of supply, including at times when the output of intermittent renewables (such as wind and solar) is low, and the CRM has to date contracted and delivered much new capacity that will help ensure security if supply in Ireland (including within the Greater Dublin area) and Northern Ireland. Following the 2028/29 T-4 auction, the CRM auctions to date have contracted a total of 4,169MW$_d$ of multi-year new capacity contracts for 2028/29, net of terminations, excluding refurbishing units.

As of April 2025, a total of just over 1,000 MW$_d$ of the multi-year new capacity contracted for 2028/29 has already achieved completion, of which around 400MW$_d$ is in Ireland and around 600MW$_d$ is in Northern Ireland. This includes just over 780MW$_d$ of new gas-fired capacity that is critical to security of supply.

It is expected that new renewable capacity will be primarily financed by RESS schemes. The CRM primarily supports the energy transition by financing technologies such as gas turbines, storage and demand side reduction, which can help facilitate high levels of renewables and ensure security of supply when wind and solar output is low.

The CRM is also directly contributing to decarbonisation. Multi-year new capacity delivered under the CRM is making a significant contribution to decarbonisation since it includes:

- The 600MW$_d$ of new capacity in Northern Ireland that has replaced high carbon emitting coal plants;
- Just under 140MW$_d$ of new battery capacity; and
- Just under 100MW$_d$ of peat-to-biomass conversion, which also will support the long-term transition to the low carbon economy.

This paper is a summary of the decisions made by the SEM Committee in determining the volumes procured for the 2028/29 T-4 auction and the factors which the SEM Committee took into account in making these decisions. The paper aims to improve transparency in volume setting, in line with one of the recommendations of the EY Review of the Performance of the SEM Capacity Remuneration Mechanism (CRM)[1].

The paper also summarises the impact that the CRM has had on security of supply, and how it has contributed to meeting decarbonisation goals.

In April 2024, the TSOs calculated an all-island initial Capacity Requirement of 7,120 de-rated MW (MW$_d$), which is the amount of de-rated capacity required to meet the all-island reliability standard without transmission constraints. As of April 2024, the all-island reliability standard was set at 6.5 hours of Loss of Load Expectation (LOLE). A 6.5-hour LOLE standard means that the expected number of hours where there is insufficient generation, interconnection and storage capacity to meet all demand will be six and a half hours per year.

There are material transmission constraints between Ireland and Northern Ireland, and within Ireland between the Greater Dublin area and the “rest of Ireland”. As these constraints are highly unlikely to be resolved within four years, the TSOs also calculated the minimum requirements of the key Locational Constraint Capacity Areas (LCCAs).

[1] https://www.semcommittee.com/files/semcommittee/media-files/SEM-22-054A%20Performance%20of%20the%20SEM%20CRM.pdf

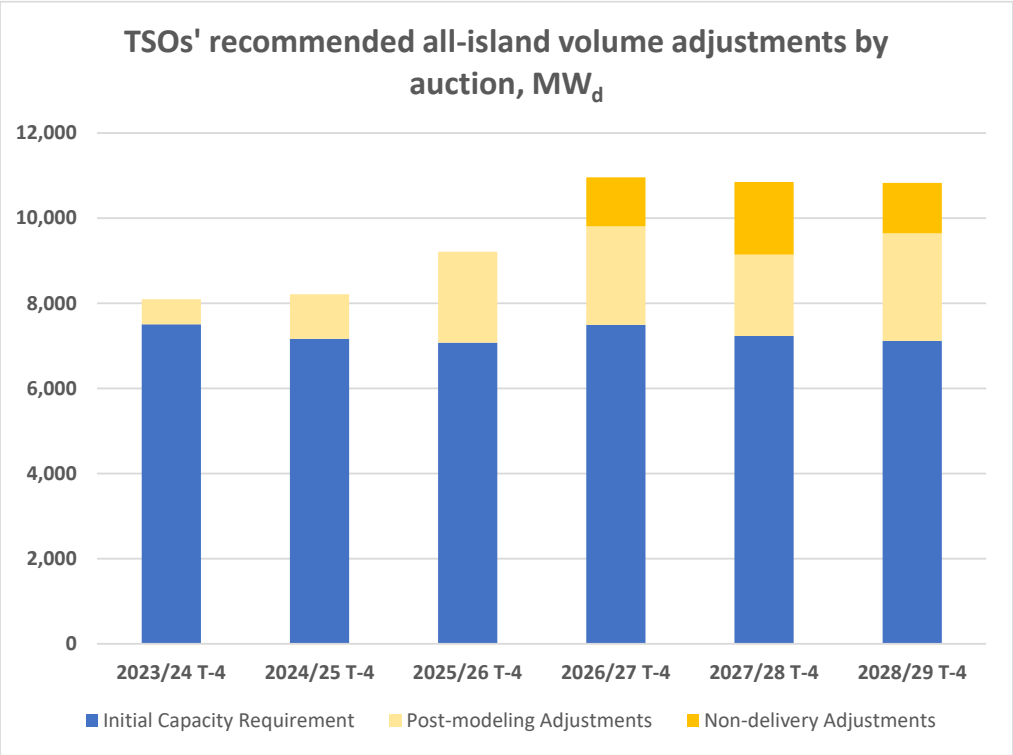
There are also short circuit issues within Greater Dublin, which limit the maximum capacity that can be connected or run at any given time within Greater Dublin, without risking a breach of the short circuit limits set out in the Grid Code. The combination of short circuit constraints, which limit generation in Greater Dublin, and transmission constraints, which limit the capacity to import power into Greater Dublin, are likely to persist for a number of years. In the meantime, other operational solutions should be used to manage short circuit levels until network reinforcement works are complete.

The planning and permitting system in Ireland is a significant factor in constraining the ability to build and connect capacity. It constrains the ability of capacity providers to build new capacity, whilst also presenting a challenge to capacity providers and the electricity and gas TSOs and DSOs in building new connections and addressing constraints.

In addition to the aforementioned TSO calculations, the TSOs also estimated 419MW$_d$ of non-participating capacity, predominantly accounted for by the new Celtic interconnector, which will connect Ireland and France, and is expected to be operational before the start of 2028/29. The Celtic interconnector has a maximum capacity of 700MW, and is assumed to provide 354MW$_d$ of capacity support in 2028/29 at times of system scarcity, improving the security of supply position. The remainder of the 419MW$_d$ is accounted for by wind and solar capacity.

The TSOs calculate the initial Capacity Requirement in accordance with the Capacity Requirement and De-Rating Factor Methodology, which is approved by the Regulatory Authorities. The TSOs calculate the Required Quantities for each Locational Capacity Constraint Area in accordance with the Locational Capacity Constraint Area methodology, which is also approved by the Regulatory Authorities. In addition, the TSOs also provide a number of adjustments for consideration by the Regulatory Authorities to account for factors that are not explicitly referenced in the approved methodology but are, in the TSOs' view, nonetheless important for inclusion in the final Demand Curve and the locational Required Quantities. Whilst the Regulatory Authorities have approved the methodology for the calculation of the initial Capacity Requirement, the Regulatory Authorities have not approved the methodology for the adjustments and review the TSOs' proposed adjustments prior to each auction, and consider how much of the TSOs' proposed adjustments to accept.

In the chart below, the initial Capacity Requirements, which are calculated according to the approved methodology, are illustrated in blue and the additional adjustments are in yellow and amber. At the time of the 2023/24 T-4 auction, the TSOs proposed three different types of adjustments totalling 585MW$_d$, an 8% addition to the requirement calculated using the approved methodology. By the 2028/29 T-4 auction, the TSOs' proposed adjustments had grown to 3,678MW$_d$, an addition of more than 50% to the initial Capacity Requirement. This increase in adjustments is explained in part by a significant increase in non-delivery risk, which accompanies the increased volume of contracted capacity in the delivery pipeline, as well as historical data on late delivery and non-delivery of contracted capacity. The adjustments are made up of a number of different post-modelling adjustments totalling 2,492MW$_d$, as well as 1,186MW$_d$ of non-delivery adjustments. The 1,186MW$_d$ of non-delivery risk represents the TSOs' estimate of how much of the new capacity contracted in previous auctions, or expected to be contracted in this auction is not expected to deliver by 2028/29. Non-delivery includes projects which are forecast to deliver late, and projects which are expected to terminate, and is informed by the reporting from the Security of Supply Programme in Ireland.



In the view of the SEM Committee, the TSOs' proposals over-estimate the appropriate level of adjustments, because:

- There are areas where the SEM Committee considered that the TSOs' estimates were unduly conservative (e.g. the impact of Annual Run Hour Limits and DSU adjustments);
- About 1,050MW$_d$ of the TSOs' proposed volumes go beyond what is necessary to ensure that the target 6.5 all-island LOLE standard is met, including most of 700MW$_d$ to cover target operating reserve and 350MW$_d$ in Ireland to cover Transmission Outage Planning. For instance, if the SEM Committee agreed to the inclusion of the full 700MW$_d$ of target operating reserve, it would mean that there would be an expectation that there would be 6.5 hours where the amount of available capacity was insufficient to meet the sum of demand and target operating reserve. However, in some of those 6.5 hours, whilst there would be insufficient capacity to provide target levels of operating reserve, customers would not experience lost load.;
- Some conservative assumptions are already built into the standard methodology (e.g. use of the Least Worst Regrets approach, which tends to procure capacity for a demand scenario which is between the TSOs' Median and High case forecasts);
- Whilst some of the proposed adjustments represent a reasonably prudent estimate of the additional capacity required to mitigate the impact if that individual risk event materialises, the TSOs' proposed approach of adding the adjustments does not adequately capture the diversification effects between the risks, or the fact that other mitigations can apply; and
- The size of the non-delivery adjustment reflects the amount of New Capacity needed; so, to the extent that the SEM Committee considers that some of the other proposed adjustments are conservative, the requirement for New Capacity is reduced, and the non-delivery adjustment should be reduced further.

The SEM Committee approved a set of adjustments, which took into account risk diversification and the appropriate cost-benefit trade-off for consumers. An allowance was made for the capacity contracted for 2028/29 in previous auctions. As a result, the

SEM Committee approved net requirements for this auction of 4,899MW$_d$ at all-island level, 4,479MW$_d$ in Ireland and 1,546MW$_d$ in Northern Ireland. The sum of the local requirements for Ireland and Northern Ireland was 1,126MW$_d$ greater than the all-island requirement, illustrating the scale of the additional capacity cost to consumers resulting from delays to the north-south tie-line upgrade.

Until the north-south tie-line is complete, volume decisions made at local level will have a significant influence on contracted volumes. The SEM Committee approved requirement for Ireland was 945MW$_d$ lower than the TSOs' proposed value, and the approved requirement for Northern Ireland was 156MW$_d$ less than the TSOs' proposed value, so in aggregate the SEM Committee's target volumes were 1,001MW$_d$ less than proposed by the TSOs.

Contents

1. Introduction

This paper is a summary of the decisions made by the SEM Committee in determining the volumes procured for the 2028/29 T-4 auction, and the factors which the SEM Committee took into account in making those decisions. The paper also summarises the impact that the CRM has had on security of supply, and how it has contributed to meeting decarbonisation goals. It follows a similar format to the 2026/27 and 2027/28 T-4 Auction Volumes Information Notes (SEM-23-089[2] and SEM-24-051[3]) published in 2023 and 2024.

This note aims to improve transparency in volume setting, in line with the EY Review of the Performance of the SEM Capacity Remuneration Mechanism (see SEM-22-054a), which recommended that there be better "explanation of process by which GCS[4] forecasts are translated to Target Volume to procure". The RAs recognise that there are a number of factors which hinder transparency in understanding how demand forecasts translate into initial Capacity Requirements and will seek to further improve transparency via the use of a Panel of Technical Experts (PTE).

This information note focuses on the process within the 2028/29 T-4 auction, as distinct from the GCS/NRAA forecasts themselves. The GCS/NRAA methodology is currently undergoing significant change in order to comply with Article 24 of the Electricity Regulation (EU) 2019/943 and be based on the European resource adequacy assessment methodology.

Prior to each auction, the TSOs calculate the initial Capacity Requirements [5]. The methodology and assumptions for the initial Capacity Requirement have been consulted upon and approved by the SEM Committee. An initial Capacity

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[2] https://www.semcommittee.com/files/semcommittee/2023-11/CRM%2026_27%20T-4%20Auction%20Volumes%20Information%20Note.pdf

[3] https://www.semcommittee.com/files/semcommittee/2024-07/SEM%20-%2024%20-%20051%202027-28%20T-4%20Volumes%20Information%20Note.pdf

[4] Generation Capacity Statement

[5] The TSOs calculate the All-Island Capacity Requirement and the Locational Capacity Constraint Required Quantities for each Locational Constraint Capacity Area (LCCA) for approval by the SEM Committee

Requirement[6] recommendation is submitted by the TSOs to the SEM Committee at the Initial Auction Information Pack (IAIP) stage, just over six months in advance of the auction. The initial Capacity Requirement is based on demand forecasts set out in the TSOs' latest Generation Capacity Statement (GCS). The 2028/29 T-4 auction volumes were based on the demand forecasts from the 2023 GCS. The SEM Committee approves the initial Capacity Requirement and the definition of the Locational Capacity Constraint Areas (LCCAs) at the time it approves the IAIP, approximately 25 weeks in advance of the auction.

In addition to the initial Capacity Requirement, the TSOs estimate a number of additional volume adjustments, which are submitted to the SEM Committee. The methodology for the volume adjustments has not been consulted upon, or approved by the SEM Committee. However, the SEM Committee considers each of the TSOs' proposed adjustments on a case-by-case basis prior to each auction. Where approved by the SEM Committee, these adjustments are subsequently reflected in the all-island demand curve and the LCCA minimum required volumes, which are published in the Final Auction Information Pack (FAIP), approximately three weeks in advance of the auction.

This note explains, at a high-level, the adjustments proposed by the TSOs, and the SEM Committee's rationale for their approved volume adjustments to be applied for the 2028/2029 T-4 Auction.

The remainder of this paper is structured as follows:

- Section 2: Describes how the process for setting volumes has evolved since the inception of the current CRM;
- Section 3: Describes the respective duties and roles of the TSOs and the SEM Committee. The TSOs' primary focus is to ensure security of supply considerations are maintained through adequate transmission capacity and system reliability, whereas the SEM Committee needs to strike an appropriate balance between security of supply and cost to consumers. It is the role of the

[6] For the All-Island requirement

TSOs to advise, and the SEM Committee to decide, and to make the difficult judgement calls to achieve this balance;

- Section 4: Contains a summary of the adjustments proposed by the TSOs for the 2028/29 T-4 auction, and the minimum volumes approved by the SEM Committee following review and consideration;
- Section 5: Highlights how the 2028/29 T-4 auction has contributed to security of supply goals and highlights the achievements of the CRM in delivering capacity in recent years. It also highlights the contribution of the CRM to meeting decarbonisation goals, although it should be noted that security of supply is the primary goal of the CRM, and other measures, such as renewables support schemes are expected to finance delivery of new intermittent renewables;
- Section 6: Explains how the reliability standard has been reflected in the minimum volumes and adjustments;
- Section 7: Explains the setting of the maximum volume constraint, particularly in Greater Dublin;
- Section 8: Highlights the unprecedented level of work that needs to be undertaken to deliver the capacity that the CRM has successfully contracted, particularly at a time when a high volume of new renewable capacity is also being targeted, including via renewables support schemes outside the CRM. This section highlights the delivery risks and how these risks may constrain the build and connection of new thermal capacity, a risk also factored into volume decisions;
- Section 9: Sets out how the process is expected to evolve in the next few years, including:
    - The planned implementation of a Panel of Technical Experts, in line with the recommendations of the EY Review;

2. Key changes in adjustments

2.1 Overview

In the first CRM auction, the transitional auction for 2018/19 held in December 2017, the volume requirements were calculated based on the results of the TSOs' original capacity methodology[7]. The methodology, which relates to what is now called the initial Capacity Requirement was publicly consulted on and approved by the SEM Committee. Changes have subsequently been made to the approved methodology, following further public consultation. Whilst the TSOs calculate the initial Capacity requirement based on the latest approved methodology, in accordance with F.3.1.4(b) of the Capacity Market Code (CMC), the all-island demand curve may reflect an adjusted Capacity Requirement modified for an allowance for changes in forecast capacity requirements as considered appropriate by the RAs. Similarly, F.4.1.8B of the CMC sets out the ability of the RAs to modify the Locational Capacity Constraint Required Quantities. There is no approved methodology for the adjustments. In adjusting the all-island demand curve and Locational Capacity Constraint Required Quantities, the SEM Committee's decisions are informed by advice from the TSOs. In recent years, the TSOs have been recommending an increasing volume of adjustments. Typically, the SEM Committee has approved many, but not all, of the TSOs' recommended adjustments.

At the time of the 2023/24 T-4 auction, held in March 2020, the TSOs proposed three different types of adjustments totalling 585 de-rated MW (MW_d) in addition to the initial Capacity Requirement of 7,510 MW_d, so adjustments accounted for around 8% in addition to the TSOs' modelled initial Capacity Requirement. In subsequent auctions, both the number and volume of adjustments proposed by the TSOs has grown substantially. The adjustments can be grouped into two categories:

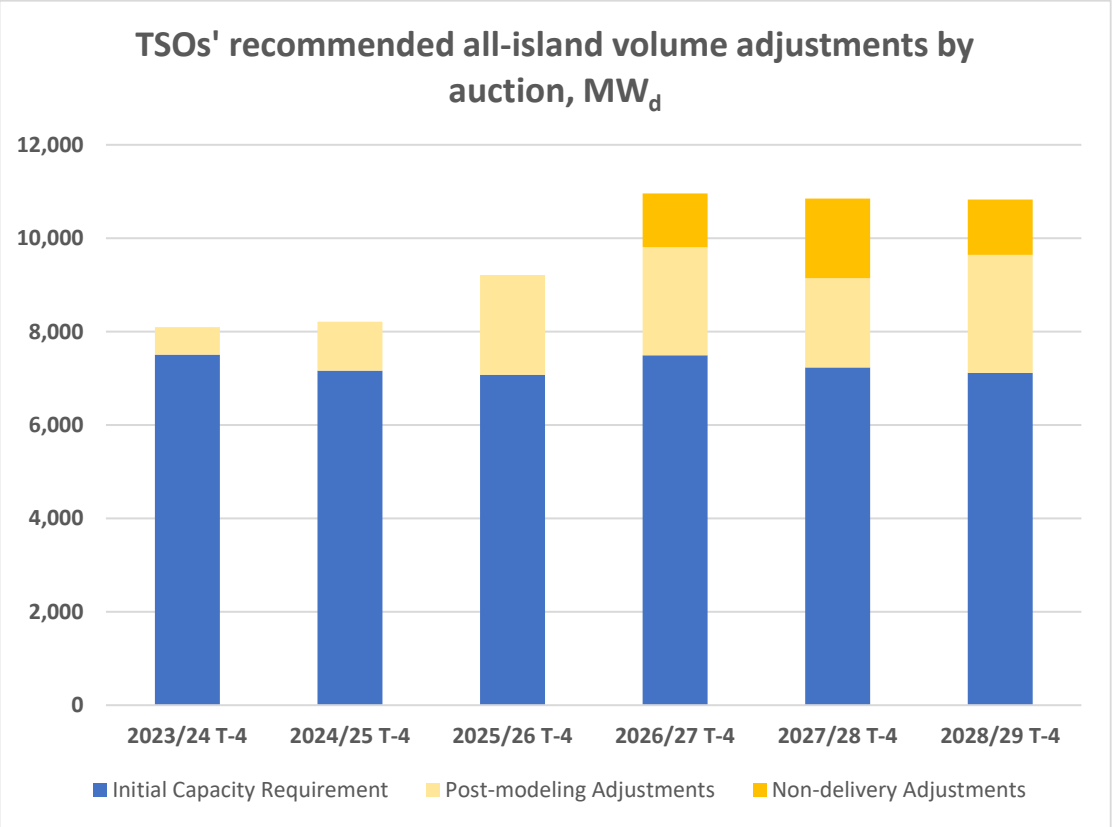
- Post-modelling adjustments, which are proposed to address limitations in the current methodology for calculating the initial Capacity Requirement and to address legacy issues; for instance, where the TSOs believe that multi-year contracts over-value the likely capacity contribution of Previously Awarded Capacity; and

[7] With an appropriate deduction for intermittent solar and wind output which was providing capacity, but chose not to participate in the auction

- Non-delivery adjustments, where the TSOs seek to estimate the amount of multi-year New Capacity which has been previously contracted or will be contracted in this auction, but will not deliver in time for the relevant Capacity Year. The non-delivery adjustments seek to increase the volume of capacity contracted to compensate.

As shown in Figure 1 below, for the 2027/28 T-4 auction, the TSOs proposed 3,618MW$_d$ of all-island adjustments, approximately 50% of the TSOs' modelled initial Capacity Requirement. Of these, 1,863MW$_d$ related to post-modelling adjustments and 1,705MW$_d$ related to non-delivery risk adjustments. For the 2028/29 auction, the TSO recommended 3,678MW$_d$ of all-island adjustments, higher than in any previous year, and totalling 52% of the initial Capacity Requirement of 7,120MW$_d$. The TSOs' recommended post-modelling adjustments increased significantly to 2,492MW$_d$, partially offset by a fall in the recommended non-delivery adjustment to 1,186MW$_d$. In the last few years, the CRU has worked extensively with EirGrid in implementing the Security of Supply Programme in Ireland, which amongst other activities, actively monitors progress in delivering significant new build projects awarded capacity contracts in previous CRM auctions. Substantial effort has been made by both the TSOs and the SEM Committee to align the non-delivery assumptions with the timelines reported through the Security of Supply Programme.

Figure 1: TSOs' recommended all-island volume adjustments by T-4 auction, MW_d



The adjustments that the SEM Committee approves prior to each auction are then reflected in the key volume parameters, which are published in the Final Auction Information Pack (FAIP). The key volume parameters are the auction demand curve, and the minimum quantities required in each LCCA.

3. Roles of the SEM Committee and the TSOs

The TSOs are responsible for a safe, secure and reliable supply of electricity. Whilst the TSOs have economic obligations[8], their primary focus is ensuring security of supply.

[8] For instance:

- Under Condition 12 of its EirGrid's System Operator Licence, it has a requirement to procure "assets, services and Ancillary Services from the most economical sources available to it having regard to the quantity and nature of the assets, services and Ancillary Services required to enable it to discharge its obligations."
- Under Condition 23A(g) of the SONI licence, SONI is required "(g) through the development of the Capacity Market, to promote the short-term and long-term interests of consumers of electricity with respect to price, quality, reliability, and security of supply of electricity across the Island of Ireland."

The TSOs are responsible for calculating the capacity requirements and advising the SEM Committee on volumes to be procured. It was originally envisaged that the calculation of capacity requirements would be largely formulaic, with the TSO models applying the methodology which had been consulted and approved by the SEM Committee. However, over the years, the adjustments to the modelled initial Capacity Requirement have grown substantially, to the extent that the TSOs proposed adding 3,678MW$_d$ in adjustments to the 2028/29 T-4 auction, i.e., 52% additional to the modelled initial Capacity Requirement.

Whereas the modelling of the initial Capacity Requirement is based on agreed methodologies, underpinned by engineering and economic principles, many of the adjustments proposed by the TSOs require the exercise of judgement. The size of the adjustments proposed depends on the level of risk the TSOs choose to take relating to the adjustments. For example:

- What proportion of the multi-year New Capacity which has been previously contracted and is in the delivery pipeline will deliver on time, what proportion will deliver late, and what proportion will fail to deliver? The multi-year New Capacity in the delivery pipeline equates to the equivalent of around 50% of the existing thermal generation fleet. The TSOs, Departments and the RAs have set up a monitoring programme. As a result, whilst significant uncertainty remains (e.g., delays to planning consents, environmental permitting, grid and gas connection, as well as the continued impact of the war in Ukraine on supply chain disruptions), the TSOs and the RAs have made substantial progress in aligning assumptions about non-delivery in recent years.
- Will the average reliability of the generation fleet continue to decline, once new capacity replaces older units or once capacity is refurbished under the new provisions for Intermediate Length Contracts[9]?

[9] In the calculation of the initial capacity Requirement, the technology specific availability / reliability assumptions are determined based on a 5-year historical average, as per the methodology approved by the SEM Committee

- The need to replace high-emissions plant at a time of data centre-driven demand growth is placing strain on the industry, and there is no relevant historical parallel on which to base assumptions.
- Would the availability of demand side units (DSUs) in a scarcity event be better than their average availability across the year as a whole, and would the availability of DSUs improve during scarcity events if energy market rule changes were implemented to remunerate them for demand reduction below their nominal baseline market demand from SEM?

As discussed in SEM-24-051, it is necessary to make a judgement about how risks are correlated and how much they diversify.

The TSOs, as prudent operators whose primary focus is security of supply, tend to take a conservative approach with respect to risk diversification and other key assumptions.

The SEM Committee[10] is the decision-making authority for all Single Electricity Market (SEM) matters, covering both Ireland and Northern Ireland. The principal objective of the SEM Committee is to protect the interests of consumers of electricity by promoting effective competition between persons engaged in, or in commercial activities connected with, the sale or purchase of electricity through the SEM[11]. In pursuing this objective, the SEM Committee is required to have regard (amongst other things) to ensure that all reasonable demands for electricity in Ireland and Northern Ireland are met.

When making decisions on volumes to be procured, the SEM Committee has to balance the all-island consumers' interests in having access to low-cost energy against security of supply risks.

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[10] Established in 2007 following the introduction of the SEM, legislation required the establishment of SEM governance in the form of a SEM Committee, and consist of three representatives from the Commission for Regulation of Utilities (CRU) in Ireland and three representatives of the Utility Regulator (UR) of Northern Ireland along with an independent and a deputy independent member.

[11] https://www.semcommittee.com/about-us#:~:text=The%20principal%20objective%20of%20the,of%20electricity%20through%20the%20SEM.

The SEM Committee has taken a balanced approach when approving adjustments to CRM auction volumes. On the one hand, if adjustments are too conservative, they run the risk of further increasing consumers' capacity bills. On the other hand, the SEM Committee is also aware that if a higher-than-expected number of risks materialise, then the cost / MW_d / year of remedial actions could be significantly greater than the cost of procuring more capacity via T-4 auctions.

4. Volume decisions for 2028/29 T-4 auction

4.1 All-island Overview

The TSOs submitted recommendations to the SEM Committee for the following adjustments to the all-island Capacity Requirement and LCCA required quantities for the 2028/29 T-4 auction:

- Eight different post-modelling adjustments, totalling 2,492MW_d of capacity at all-island level, which was a substantial increase on the 1,863MW_d of adjustments that the TSOs recommended for the 2027/28 T-4 auction. The post-modelling adjustments included 780MW_d to account for the TSOs' estimates of the impact of Annual Run Hour Limits, 700MW_d of reserves to cover the Largest Single Infeed (Celtic interconnector), 365MW_d of adjustments to cover the TSOs' view that DSU DRFs are over-valued, 350MW_d of adjustments to cover Transmission Outage Planning (TOPs) to facilitate the connection of intermittent renewables, and 330MW_d to cover contracts awarded in previous auctions based upon previous DRFs which exceed DRFs published in the IAIP.
- A further 1,186MW_d of adjustments at all-island level, to increase the amount of capacity sought to reflect the risk of non-delivery of contracted new capacity. This includes an expectation that a proportion of the 3,622MW_d of the capacity awarded in previous auctions[12] will not be commissioned in time for the start of

[12] Consistent with the values published in the FAIP, which reflects capacity previously awarded, net of terminations as of the date the FAIP was approved.

the capacity year 2028/29, and an expectation that some of the capacity to be awarded in the 2028/29 T-4 will not be commissioned in time either.

As shown in Table 1, the SEM Committee decided to approve some, but not all of the TSOs' recommendations.

Table 1: Summary of TSO recommended adjustments and SEM Committee approved volumes

	TSO Recommended				SEM Committee Decision			
	All Island	Level 1		Level 2	All Island	Level 1		Level 2
		NI (L1-1)	Ireland (L1-2)	Dublin (L2-1)		NI (L1-1)	Ireland (L1-2)	Dublin (L2-1)
Initial Capacity Requirement	7,120	1,620	5,618	2,100	7,120	1,620	5,618	2,100
Non-participating Capacity	-419	-15	-404	-19	-419	-15	-404	-19
Adjusted ISAC Requirement	6,701	1,605	5,214	2,081	6,701	1,605	5,214	2,081
Post Modelling Adjustments	2,492	684	1,861	0	822	403	756	0
Non-delivery Adjustments	1,186	75	1,189	253	0	0	0	0
Reliability Standard adjustment	0	0	121	0	0	0	121	0
Diversified Risk Adjustment	0	0	0	0	998	200	1,348	298
Gross Auction Requirement after Adjustments	10,379	2,364	8,385	2,334	8,521	2,207	7,440	2,379
Previous Awarded Capacity	-3,622	-661	-2,961	-1,042	-3,622	-661	-2,961	-1,042
Net Auction Requirement	**6,757**	**1,702**	**5,424**	**1,292**	**4,899**	**1,546**	**4,479**	**1,337**

At an all-island level, the SEM Committee:

- Approved a total of 822MW$_d$ of post-modelling adjustments to the all-island requirement, although the sum of the adjustments accepted at LCCA level was greater at 1,159MW$_d$[13]; and
- The SEM Committee also took into account the TSOs' proposed Transmission Outage Planning (TOPs) adjustment, non-delivery adjustments and annual run-hours limit adjustments when calculating the diversified risk adjustment, which diversified risk across a range of risk categories, and LCCAs. The SEM Committee included an element to cover non-delivery risk associated with units contracted in previous auctions and units to be contracted in the 2028/29 T-4 in the diversified risk adjustment. The SEM Committee approved a total of 998 MW$_d$ of diversified risk adjustment at an all-island level. However, the LCCA diversified risk adjustments across Ireland and Northern Ireland was 1,548MW$_d$.

[13] The sum of the 468MW$_d$ of post modelling adjustments for NI and 968MW$_d$ of post modelling adjustments for Ireland

The SEM Committee's decisions reflected a number of factors including:

- Areas where the SEM Committee considered that the TSOs estimates were conservative (e.g. the impact of Annual Run Hour Limits, DSU adjustments);
- About 1,050MW$_d$ of the TSOs' proposed volumes go beyond what is necessary to ensure that the target 6.5 all-island LOLE standard is met. The TSOs' recommendation included an extra 700MW$_d$ to cover target operating reserve (i.e. spare capacity that the system can call on, over and above what is necessary to meet demand) and 350MW$_d$ in Ireland to cover Transmission Outage Planning (TOPs) to connect new renewable generation faster. If the SEM Committee agreed to the inclusion of the full 700MW$_d$ of target operating reserve, it would mean that there would be an expectation that there would be 6.5 hours where the amount of available capacity was insufficient to meet the sum of demand and target operating reserve. However, in some of those 6.5 hours, whilst there would be insufficient capacity to provide target levels of operating reserve, customers would not experience lost load. The 350MW$_d$ of TOPs adjustment is to support transmission outages in order to connect new renewables capacity at a faster rate. However, if the planned transmission outages do not coincide with scarcity periods, this additional capacity will be available to provide support at key times, and likely to reduce hours of lost load.
- Some other conservative assumptions are already built into the standard methodology (e.g. use of the Least Worst Regrets approach[14], which tends to procure capacity for a demand scenario which is between the TSOs' Median and High case forecasts);
- Whilst some of the proposed adjustments represent a reasonably prudent estimate of the additional capacity required to mitigate the impact if that individual risk events materialises, it is unlikely that all risks will materialise simultaneously. The TSOs proposed approach of adding the adjustments does

[14] The Least Worst Regrets approach takes 10 demand scenarios ranging from the GCS High Case scenario to the GCS Low Case scenario, and calculates the "regret cost" on for each scenario, in each of the 10 scenarios. The regret cost which is either the amount paid for additional unused capacity in scenarios which procure too much capacity, or the additional costs of Unserved Energy in cases which procure too little capacity.

not adequately capture the diversification effects between the risks, or the fact that other mitigations can apply; and

- The size of the non-delivery adjustment reflects the amount of New Capacity needed, so to the extent that the SEM Committee considers that some of the other proposed adjustments are conservative, the requirement for New Capacity is reduced, and the non-delivery adjustment should be reduced further.

4.2 Decisions at LCCA level

At LCCA level, the SEM Committee approved:

- 2,226MW$_d$ of adjustments in L1:2 Ireland, which is 70% of the 3,171MW$_d$ recommended by the TSOs, a difference of 945MW$_d$; and
- 603MW$_d$ of adjustments in Northern Ireland, which is 79% of the 759MW$_d$ recommended by the TSOs, a difference of 156MW$_d$.

As a result, the SEM Committee approved Gross Auction Requirement of:

- Ireland: 7,440MW$_d$, including a Gross Auction Requirement of 2,379MW$_d$ in Greater Dublin;
- Northern Ireland: 2,207MW$_d$.

It is the LCCA Gross Auction Requirements that are published in the FAIP[15], and the LCCA values of Previously Awarded Capacity published in the FAIP[16] must be deducted from the published Gross Auction Requirements to calculate the Net Auction Requirements being sought.

When procuring capacity at a regional level, the SEM Committee also needs to bear in mind that capacity procured for locational reasons in Ireland is borne in part by consumers in Northern Ireland, and capacity procured for locational reasons in Northern Ireland is borne in part by consumers in Ireland. Therefore, the SEM Committee has to give careful consideration to adjustments which are targeted at

[15] Published in Table 4 of the 2027/28 T-4 FAIP

[16] Published in Table

achieving a policy objective in one jurisdiction only via the CRM. For instance, where the SEM Committee approves the Transmission Outage Planning adjustment in Ireland, to support the Government of Ireland's renewables targets, consumers in Northern Ireland bear a share of the costs.

5. Impact of CRM to date

5.1 Impact of the 2028/29 T-4 auction

The 2028/29 T-4 auction resulted in the procurement of around 606MW$_d$ of New Capacity, of which around 559MW$_d$ is in Ireland and around 46MW$_d$ in Northern Ireland. The 606MW$_d$ is significant in relation to the size of the market; it represents over 8% of forecast peak demand in 2028[17], and will have a material impact on security of supply. The SEM Committee's target volumes were met in Ireland, but there was a shortfall of around 81MW$_d$ versus the SEM Committee's target volumes in Northern Ireland, due to the lack of capacity offered.

Of the 606MW$_d$ of New Capacity, 501MW$_d$ of this is multi-year New Capacity, which will support security of supply for a minimum of five years, and in most cases, 10 years. Multi-year New Capacity can be paid for early delivery of capacity from 1 October 2027 under the recently implemented Early Delivery Incentive, and some of the 501MW$_d$ of capacity (particular battery storage capacity) may be able to provide capacity support from Winter 2027/28 and address the shortfall in capacity procured in the 2027/28 T-4 auction.

After the auction, the SEM Committee calculated the effect of its decisions on consumer bills. The consumer bill for the T-4 auction was €954m, which, added to the €479m[18] cost of the 3,622MW$_d$ of multi-year capacity procured for 2028/29 in prior auctions, brings the consumer bill to €1.432bn, circa €110 per year for the average household. However, not all of the capacity awarded in previous auctions is expected to be delivered by the start of 2028/29, which is why the SEM Committee made a

[17] The 23GCS median TER all-island peak forecast is 7,460MW

[1818] The estimate of €479m takes account of terminations up to November 2024, but does not take account of the impact of the cost of indexation resulting from the SEM Committee's decision to allow indexation during the build period for the increase in capex costs of New Capacity contracted during the 2024/25 T-3 and 2025/26 T-4 auctions.

significant provision for non-delivery risk in the diversified risk adjustment. If capacity is delivered late or terminates, the outturn cost to consumers will be commensurately reduced.

Whilst the primary aim of the CRM is ensuring security of supply, the most recent 2028/29 T-4 auction also supported decarbonisation goals in a number of respects, including:

- Contracting 132MW$_d$ of new “other storage” (i.e. battery storage (BESS)) capacity that will support decarbonisation goals by enabling the storage of energy generated by intermittent renewables. The 132MW$_d$ of BESS capacity is a record for any auction to date. The 132MW$_d$ equates to 627MW of rated capacity, which is likely to contribute significant flexibility. The BESS capacity all has a duration of at least two hours and includes over 150MW rated of capacity which has a duration of 6 or more hours. More longer duration storage will be required if the island of Ireland is able to “keep the lights on” without resorting to burning gas at times when renewables output is low.
- The auction secured investment in refurbishing 1,646MW$_d$ of existing capacity including:
    - Over 1,529MW$_d$ of existing Combined Cycle Gas Turbines (CCGT), by extending unit life and/or improving the unit’s efficiency. CCGTs are a lower carbon alternative to building new Open Cycle Gas Turbine capacity, so securing such significant investment will help deliver a lower carbon transition path;
    - Two key Pumped Storage units, which will play a critical role in the transition to a system with a high penetration of intermittent renewables;
    - Converting some small diesel units to Hydrogenated Vegetable Oil (HVO)).

  The investment was secured at an average cost below the New Capacity Investment Rate Threshold, of €300,000/MW$_d$, and at a price well below the costs per MW$_d$/yr of new capacity.

5.2 Overall impact of CRM to date on security of supply

Following the 2028/29 T-4 auction, the CRM auctions to date have contracted a total of 4,169MW$_d$ of multi-year New Capacity contracts for 2028/29, net of terminations, excluding refurbishing units[19]. Of this capacity 3,462MW$_d$ is in Ireland and 707MW$_d$ is in Northern Ireland.

Around 3,031 MW$_d$ of the 4,169MW$_d$ is new multi-year capacity is gas-fired, which will be critical to security of supply at times when intermittent renewables output is low. As of April 2025, a total of just over 1,000 MW$_d$ of the multi-year New Capacity contracted for 2028/29 has already achieved completion, of which around 400MW$_d$ is in Ireland and around 600MW$_d$ is in Northern Ireland. This includes just over 780MW$_d$ of new gas-fired capacity that is critical to security of supply.

In addition, the CRM has secured significant investment to refurbish and life extend existing capacity, with 5-year contracts, known as Intermediate Length Contracts (ILCs), awarded to refurbish 1,646MW$_d$ of existing units[20]. Refurbishing capacity is expected to be a lower risk alternative to building new capacity, with lower risk of planning and permitting delays and with limited need for grid investment. The successful refurbishment projects will include a range of benefits, including extending the life of some efficient Combined Cycle Gas Turbine (CCGT) capacity, increasing efficiency and flexibility, and cutting carbon emissions. At this stage of the energy transition, refurbishing existing CCGTs is a lower cost, lower carbon alternative to building new gas turbine capacity. Building new gas-fired capacity, which is not capable of operating at net zero and which would normally be expected to have an asset life of twenty or more years, risks creating stranded assets. Life-extending existing CCGTs will provide significant cost savings for consumers and deliver a more balanced, lower carbon portfolio over the next decade[21].

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[19] Under the terms of CMC_10_24, refurbishing capacity, once awarded an ILC, is deemed New Capacity, but for the purposes of this document, we have not included the 1,646MW$_d$ of refurbishing capacity in the 4,169MW$_d$ of New Capacity

[20] Note that once awarded, capacity with an ILC is deemed as New Capacity is treated as New Capacity, but for the purposes of reporting in this document, they are not included in the 4,169MWd of New Capacity, which refers to genuine new build as opposed to refurbishment of capacity that already existed.

[21] Intermediate Length Contracts relate to the period 1 October 2028 to 30 September 2033

The CRM has made significant progress in securing security of supply in the Greater Dublin area, which has seen the challenge of high demand growth, driven by data centres. The Greater Dublin area faces a short circuit issue, which requires reinforcement of transmission lines and limits the volumes that can be procured there, although other approaches may also assist in the nearer term. Notwithstanding these challenges, three new OCGTs totalling 172MW$_d$ and two new BESS units totalling 57MW$_d$ have already been completed in the Greater Dublin area. Furthermore, the 2028/29 T-4 auction secured investment in three of the four CCGTs in the Greater Dublin area, which will ensure their continuing availability through September 2033, alleviating security of supply concerns associated with the difficulty of building replacement new capacity or new transmission lines.

5.3 CRM and decarbonisation

The primary objective of the CRM auctions is to ensure security of supply, including at times when the output of intermittent renewables (such as wind and solar) is low. Accordingly, the CRM rewards units in proportion to their ability to support system security at times of system stress[22], which is typically at times when the output of intermittent renewables is low. It should be noted that the CRM is not the primary mechanism by which new renewable capacity are financed. It is expected that new renewables capacity will be primarily financed by RESS schemes, which will be the key component in facilitating the achievement of the environmental targets of the Government of Ireland and the Government of Northern Ireland, both of which have RES-E targets of 80% by 2030.

The CRM supports the energy transition by continuing to finance technologies such as gas turbines, storage and demand side reduction, which can “keep the lights on” when wind and solar output is low. It is likely that CRM support will be increasingly needed to support technologies such as gas turbines, which will still be needed to “keep the lights on” in the next few years, as their ability to recover their costs from energy

[22] Through the system of de-rating factors

market revenue alone will reduce as their generation opportunities are increasingly limited by greater wind and solar output.

However, as noted above, the latest auction supported decarbonisation objectives in a number of ways. It should also be noted that the 1,000MW$_d$ of multi-year New Capacity already delivered is already making a significant contribution to decarbonisation since:

- The 600MW$_d$ of new capacity already delivered in Northern Ireland has replaced high carbon emitting coal plants, allowing the last coal units in Northern Ireland to be retired;
- Just under 140MW$_d$ of new BESS capacity has already been completed; and
- Just under 100MW$_d$ of peat-to-biomass conversion has been completed, which also will support the long-term transition to the low carbon economy.

6. Reliability Standard

The All-Island initial Capacity Requirement, and those for the Northern Ireland and the all island Level 1 LCCAs[23] were calculated based on the 6.5-hour LOLE Reliability Standard. The 6.5-hour LOLE all-island standard was set based on the results of recent VoLL and Net CONE studies based on the ACER methodology (see SEM-23-072).

However, in Ireland, DECC, working with the CRU, decided to set a 3-hour LOLE Reliability Standard for Ireland. Moving from a 6.5-hour to a 3-hour standard resulted in an increment of 121MW$_d$ to the Capacity Requirement in Ireland.

7. Maximum Volume Constraints

As noted in the SEM-24-051, the TSOs consider that there are issues in regard to short circuit levels within the Greater Dublin network which mean that little or no net additional generation capacity can be connected in the Greater Dublin area. The TSOs advised that it would not be appropriate to connect net additional capacity in the

[23] The requirements for Level 2 LCCAs are calculated based upon a different approach as set out in SEM-17-040a

Greater Dublin area, until such time as short circuit risks are alleviated. The TSOs further advised that the route to easing the constraint on net additional capacity is to upgrade the transmission network in Dublin, that these changes may take them a number of years to deliver, and that there may be limited scope for any net additional capacity in Greater Dublin in the 2020s.

As a result, in the 2028/29 T-4 auction, the SEM Committee approved a Greater Dublin maximum volume constraint, set at a gross capacity[24] of 2,379MW$_d$, which was consistent with contracting all Existing Capacity and already contracted New Capacity in Greater Dublin.

The concern was that if there was insufficient competitively priced capacity offered in the "rest of Ireland" or Northern Ireland, the auction could clear more capacity in Greater Dublin than could be used at any given time, resulting in consumers paying for more capacity in Greater Dublin than could be used.

Given the Previously Awarded Capacity of just under 1,042MW$_d$ in Greater Dublin, it meant that the 2028/29 T-4 auction was seeking to procure a maximum of 1,337MW$_d$ of Existing and New Capacity in Greater Dublin. The SEM Committee also decided to increase the Greater Dublin minimum target volume and set it equal to the maximum volume.

Maximum volumes of 20,000MW$_d$ were approved for the other LCCAs (Northern Ireland, and Ireland as a whole) on the basis that 20,000MW$_d$ was a large number, which in practice would mean that maximum volume constraints would not bind in those LCCAs.

In the event, the 2028/29 T-4 auction contracted exactly the target volume in Greater Dublin, leaving approximately 34MW$_d$ of offered capacity uncontracted. In the absence

[24] The maximum volume constraints are specified gross of Previously Awarded Capacity in the FAIP, so with a maximum constraint of 2,379MW$_d$ and Previously Awarded Capacity of 1,041.566MW$_d$, the 2028/29 T-4 auction was looking to procure a maximum volume of 1,337.434MW$_d$. It was also recognised that it may not be possible to simultaneously satisfy a minimum volume constraint, a maximum volume constraint and the inflexibility constraints in an LCCA if minimum and maximum volumes are sufficiently close together. The FAIP specified "prices" for exceeding the maximum volume constraints and for undershooting the minimum volume constraint, which could result in the maximum volume constraint being exceeded under certain circumstances.

of a Greater Dublin maximum constraint, the auction may have contracted some or all of this 34MW$_d$, instead of an equivalent amount of capacity in the “rest of Ireland”.

8. Capacity delivery and challenges

The electricity and gas systems of Ireland and Northern Ireland are facing an unprecedented level of change to replace high emissions plant, connect new renewables and storage, meet increasing demand and make other changes required to deliver decarbonisation. The CRM is an important component of the transition, and key to facilitating delivery of storage capacity and to “keep the lights on” on the road to net zero. The CRM will not, on its own, deliver the path to net zero. However, in the short term, the CRM is key to significantly reducing carbon emissions, whilst maintaining security of supply, by replacing old high emissions coal, oil and peat units with storage capacity, DSUs and lower emissions gas-fired units. Additionally, as set out SEM-24-035, the SEM Committee is considering further CRM measures to support decarbonisation and intends to consult on policy measures to further the decarbonisation of the CRM, in line with the Climate Environment and Energy Aid Guidelines (CEEAG), as set out in the SEM Committee Forward Work Plan 2024-25.[25]

Building and connecting all the new CRM capacity to electricity and gas networks in contracted timeframes is a large and unprecedented challenge to the electricity and gas industry in Ireland and Northern Ireland. The magnitude of the challenge is heightened by the fact that the industry is also required to deliver almost 7,000MW of onshore and offshore renewables capacity in Ireland following the recent RESS-1, RESS-2, RESS-3 and ORESS auctions. Based on the assumptions used in the All-Island Resource Adequacy Assessment (i.e. the NRAA) 2024,[26] which uses forecasts the Sustainable Energy Authority of Ireland has developed, EirGrid expects to connect around 13GW of renewables in Ireland between 2025 and 2034. During this period,

[25] https://www.semcommittee.com/files/semcommittee/2025-03/SEMC%20-%20Forward%20Work%20Programme%20Oct24%20-%20Sept%2025.pdf

[26] https://cms.eirgrid.ie/sites/default/files/publications/AIRAA-2025-2034.pdf

based on the assumptions made in the NRAA 2024, SONI expects 2.2GW of new renewables to be connected in Northern Ireland.

The SEM Committee recognised that delivering on these challenges will place strain on scarce resources, including appropriately skilled engineers and building contractors, which may be a finite resource that constrains the rate at which new thermal and renewables capacity can be connected. Whilst these challenges and risks may be hard to quantify, the SEM Committee recognises the risk and factored this consideration qualitatively into its volume decisions. Contracting more capacity will not necessarily improve security of supply, if the capacity is competing for scarce resource, and if it makes existing contracted capacity more difficult to deliver.

9. Future Changes

Capacity Remuneration Mechanisms continue to develop and evolve, and the need for this to happen is reflected in the various reviews that assessed the SEM CRM, including the EY Report (SEM-22-054a), which was consulted upon by the SEM Committee.

One of the key recommendations of the EY Report was to promote greater transparency of the target volume setting through an assessment by a panel of technical experts (PTE) of TSO volume recommendations, with their findings published, and an explanation of the process by which GCS forecasts are translated to the target volume to procure in capacity auctions.

The SEM Committee has accepted this recommendation (see SEM-23-036), and consulted on the PTE's Terms of Reference (ToR) in SEM-24-049[27]. The SEM Committee published its decision on the ToR for the PTE in December 2024 (SEM-24-078)[28].

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[27] https://www.semcommittee.com/files/semcommittee/2024-07/SEM-24-049%20SEM%20PTE%20ToR%20Consultation.pdf

[28] https://www.semcommittee.com/publications/decision-terms-reference-tor-panel-technical-experts-pte-sem

The SEM Committee will soon initiate the process of appointing members of the PTE. Subject to no issues outside the SEM Committee's control causing a delay, it is expected the PTE will be implemented in time for the 2029/30 T-4 auction.