Integrated Single Electricity Market

(I-SEM)

Capacity Remuneration Mechanism (CRM)

Reserves

Decision Paper

SEM-18-173

30 November 2018

EXECUTIVE SUMMARY

In the recently published T-4 parameters decision paper (SEM-18-155), the SEM Committee decided to procure capacity to cover a measure of reserves in the CY2022/23 T-4 auction. In SEM-18-155, the SEM Committee also decided to reflect transmission constraints in the CY2022/23 T-4 auction. Following on from these decisions, the SEM Committee issued a supplemental consultation on reserves (SEM-18-159) focused on:

- **T-4 auction**: Whether reserves should also be included in the Local Capacity Constraint Area (LCCA) minimum MW in the CY2022/23 T-4 auction. If reserves are included at LCCA level, what approach should be used to determine the minimum MW in each area?
- **T-1 auction:** Should a measure of reserves be included in the CY2019/20 T-1 auction, at an all-island level, at an LCCA level or both? The supplemental consultation also explored whether there were grounds to use a different methodology for the T-1 auction from the T-4 auction.

As well as reviewing the case for including reserves in the LCCA minimum MW the consultation also considered different options for setting the minimum MWs including a "bottom-up" approach, whereby the sum of the LCCA reserves included could exceed the level included in the all-island Capacity Requirement, and a "top-down" approach whereby the all-island reserves total is allocated down to the LCCAs either based on the largest single infeed in that area or based on the current methodology for calculating the minimum MWs.

Eight responses were received to the CRM Reserves consultation (SEM-18-159). All non-confidential responses to the consultation (SEM-18-159) have been published on the SEM Committee website. All respondents supported the inclusion of reserves, both at an all-island level and at the LCCA level, within the forthcoming T-1 and T-4 auctions. Although the strength of support did vary from strongly agreeing to somewhat hesitantly agreeing only for the immediate term. Most respondents preferred the "bottom up" approach, with some recognising that while it gives more flexibility there is a risk that its application could be less transparent than the "top-down" approaches given.

T-4 CY2022/23 Capacity Auction

The SEM Committee has decided to include a measure of reserves in the all-island demand curve for the first T-4 auction, and to include a measure of reserves in the Level 1 and Level 2 LCCA minimum MWs for the forthcoming T-4 auction. The SEM Committee has decided to apply the "bottom-up" approach in the T-4 auction, which is consistent with the existing approach to calculating the Capacity Requirement and LCCA minimum MWs and allows the flexibility to take account of specific factors that may apply from time to time, and which may be location specific. In setting the "bottom-up" values, the SEM Committee will take account of the following factors:

- At a minimum, the additional reserves should cover the jurisdictional demand control thresholds in Ireland and in Northern Ireland; and
- Specific locational risk factors not otherwise recognised in the existing methodology, which may apply from time to time, to the extent that they are known at the T-4 stage.

The SEM Committee will set the final demand curve in the Final Auction Information Pack (FAIP) due to be published early March 2019. For future T-4 capacity auctions the proposed level of reserves will be considered in the corresponding parameters consultation for each specific T-4 auction.

T-1 CY2019/20 Capacity Auction

The SEM Committee has decided to include a measure of reserves in the T-1 CY2019/20 auction, and to use the bottom-up approach for setting the all-island and LCCA level reserves requirements. However, as more information is known at the T-1 stage than T-4 stage, adjustments for more specific factors are likely, and this could result in significantly different allocations from auction to auction.

Given the timing of this decision paper and the T-1 Final Auction Information Pack the SEM Committee are able to set out the final numbers to apply for the T-1 CY2019/20 auction.

The Capacity Requirement for the T-1 CY2019/20 auction published in the T-1 Initial Auction Information Pack was based on the demand forecast from the Generation Capacity Statement 2017-2026 (GCS 2017). However, the SEM Committee, in finalising the demand curve, will include adjustments to reflect the recently published Generation Capacity Statement 2018-2027 (GCS 2018), which increases requirements, particularly in the Greater Dublin area. In summary, applying the "bottom-up" approach, the SEM Committee has decided to add the following reserves for the T-1 CY2019/20 capacity auction:

- Not to include any additional reserves at the all-island level having taken into consideration the outcome of the qualification process and the auction format to apply for this auction;
- To include 170MW of reserves in the Level 1:1 Northern Ireland LCCA minimum MW, for potential demand control actions and to manage exit in the context of tightening emissions restrictions;
- To include 100MW of reserves in the Level 1:2 Ireland LCCA minimum MW for potential demand control actions; and
- Not to include any additional reserves in the Dublin Level 2:1 LCCA minimum MWs, having taken into account the volume of qualified capacity and the LCCA minimum MWs resulting from the existing Locational Capacity Constraint methodology.

For future T-1 capacity auctions the proposed level of reserves will be considered in the corresponding parameters consultation for each specific T-1 auction. However, similar to the approach taken for the T-1 CY2019/20 the SEM Committee will reserve the right to make further adjustments, if any locational specific risks are identified when finalising the amount to be procured within the Final Auction Information Pack for each specific T-1 auction.

To allow the SEM Committee to adjust the LCCA minimum MWs for future capacity auctions a Capacity Market Code modification (CMC_14_18 LCC MW Limits) was raised so as the SEM Committee, if necessary, can use its powers to direct the TSOs to make adjustments to the LCCA minimum MW to include the appropriate level of reserves. This modification is due to be effective 30 November 2018 and therefore can be applied to the T-1 CY2019/20 auction and the T-4 CY2022/23 auction as well as future auctions.

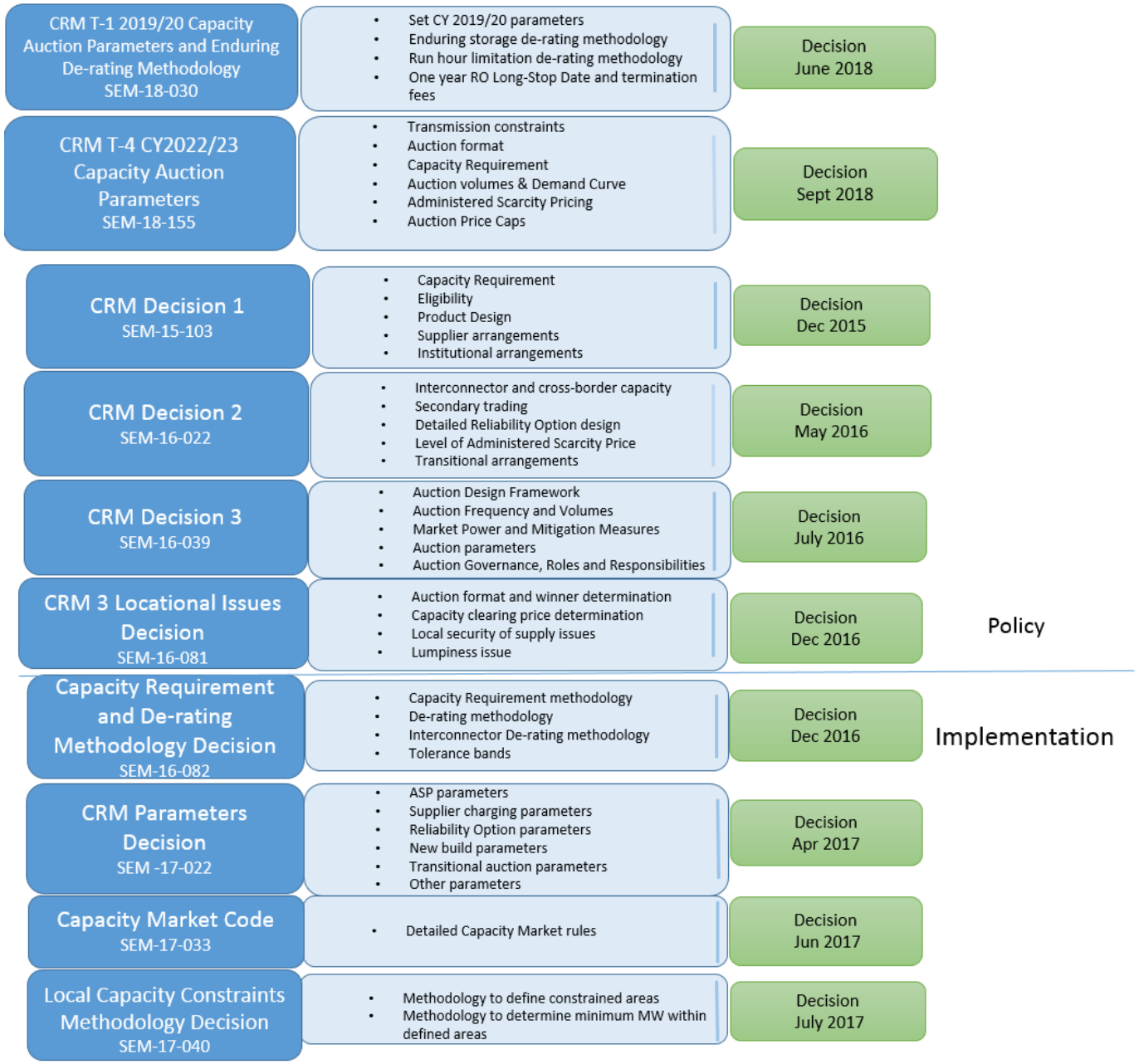
Contents

1. INTRODUCTION

1.1 BACKGROUND

1.1.1 The CRM has been designed over the past number of years through numerous consultations and subsequent decisions. A summary of the process is provided in Figure 1 below.

Figure 1: Overview of CRM Policy Development



1.1.2 The EC State Aid decision[1] was received in November 2017 and the first Capacity Auction took place on 15 December 2017 for Capacity Year 2018/19.

1.2 PURPOSE OF THIS DECISION PAPER

1.2.1 In the recently published T-4 parameters decision paper (SEM-18-155), the SEM Committee decided to procure capacity to cover a measure of reserves in the CY2022/23 T-4 auction. The SEM Committee decided that the measure should be no less than 100MW, and no more than 500MW at the all-island level. In SEM-18-155, the SEM Committee also decided to reflect transmission constraints in the CY2022/23 T-4 auction. Following on from these decisions, the SEM Committee issued a supplemental consultation on reserves (SEM-18-159) focused on:

- **T-4 auction**: Whether reserves should also be included in the Local Capacity Constraint Area (LCCA) minimum MW in the CY2022/23 T-4 auction. If reserves are included at LCCA level, what approach should be used to determine the minimum MW in each area?
- **T-1 auction:** Should a measure of reserves be included in the CY2019/20 T-1 auction, at an all-island level, at an LCCA level or both? The supplemental consultation also explored whether there were grounds to use a different methodology for the T-1 auction from the T-4 auction.

1.2.2 The All-Island Capacity Requirement for any given auction is fixed at the Initial Auction Information Pack (IAIP) stage. The IAIP for the CY2019/20 T-1 auction and the CY2022/23 T-4 auctions have already been published, and did not reflect any measure of reserves in the Capacity Requirement. However, as provided for under the Capacity Market Code, the SEM Committee would, if necessary, direct the TSOs to adjust the CY2019/20 T-1 and CY2022/23 T-4 auction demand curves (to be included in the Final Auction Information Pack (FAIP)) to reflect the decisions within this paper. The impact on the final demand curve will be similar to the outcome if the chosen measure of reserves had been included in the IAIP Capacity Requirement.

1.2.3 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 response and decision.

1.3 RESPONSES TO THE CONSULTATION

1.3.1 This paper includes a summary of the responses made to the CRM Reserves consultation paper (SEM-18-159) which was published on 5 October 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.

1.3.2 A total of 8 responses to the consultation were received and are outlined below. Copies can be obtained from the SEM Committee website.

- AES
- BGE
- Energia
- ESB

[1] http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_44464

- Bord na Mona
- Eirgrid/SONI
- Grange Energy Centre
- Power NI PPB

1.4 ASSESSMENT CRITERIA

1.4.1 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.

1.4.2 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.

1.4.3 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. RESERVES IN CY2022/23 T-4 AUCTION

2.1 INTRODUCTION

2.1.1 The recently published T-4 parameters decision paper (SEM-18-155), set out the SEM Committee's decision to include reserves within the first T-4 capacity auction. The SEM Committee decided that the level of reserves to include will be no less than 100MW, and no more than 500MW at the all-island level. The SEM Committee also decided with the T-4 parameters decision paper (SEM-18-155) that:

- Given the requirement to reflect transmission constraints in the CY2022/23 T-4 auction, it is also appropriate to consider whether the minimum MWs to be procured in constrained regions (Local Capacity Constraint Areas (LCCAs) as defined in the CMC), should also include a measure of reserves; and
- The final decision on the precise measure to include in the All-Island demand curve will be taken following the supplemental consultation regarding inclusion of reserves in LCCAs.

2.1.2 The All-Island Capacity Requirement for any given auction is fixed at the Initial Auction Information Pack (IAIP) stage. The IAIP for the CY2022/23 T-4 auction was published on 28 September 2018, and did not reflect any measure of reserves in the Capacity Requirement. However, as provided for under the Capacity Market Code the SEM Committee would, if necessary, direct the TSOs to adjust the CY2022/23 T-4 auction demand curve (to be included in the Final Auction Information Pack (FAIP)) to reflect the decisions within this paper. The impact on the final demand curve will be the same as if the chosen measure of reserves had been included in the IAIP Capacity Requirement.

2.1.3 The TSOs' Capacity Requirement Methodology and Locational Capacity Constraint methodology may require some updating to reflect the SEM Committee decisions within this paper. There may not be sufficient time to update these detailed Capacity Requirement and Locational Capacity Constraint methodologies (as set out in SEM-18-030a and SEM-17-040), in time for the production of the CY2022/23 T-4 Final Auction Information Pack and therefore the SEM Committee raised an emergency Capacity Market Code modification (CMC_14_18 LCC MW Limits). This modification was raised to allow the SEM Committee, if necessary, to use its power to direct the TSOs to make adjustments to the Locational Capacity Constraint Area minimum MW to include the appropriate level of reserves.

2.2 CONSULTATION SUMMARY

2.2.1 The key reasons for considering including a measure of reserves in the LCCA minimum MWs include:

- Ensuring consistent levels of local security of supply (at LCCA and all-island level); and
- Ensuring consistency with wider European practice on the treatment of reserves in adequacy assessments.

2.2.2 Within the T-4 parameters decision (SEM-18-155) the decision was taken to include at least 100MWs of reserves, at an all-island level, on top of the values resulting from the existing

Capacity Requirement methodology in order to ensure that the 8 hour standard is met. This reflects the fact that demand control actions are likely to be taken by the TSOs when the level of available reserves falls as low as 100MW. For example, if at any given instant, all the reserves are held on units in Ireland and the transmission network between Ireland and Northern Ireland is already fully loaded, then those units may not effectively be providing reserves to Northern Ireland.

2.2.3 To the extent that the inclusion of reserves at the all-island level is consistent with the direction of travel of EC policy, logically, it would also be consistent to include them in the local requirements too. The T-4 parameters decision paper (SEM-18-155) described how in 2017 Mid-term Adequacy Forecasts (MAF), in modelling the capacity required for capacity adequacy, ENTSO-E generally either add some measure of reserves requirement to peak demand (their preferred approach) or reduce the effective thermal generation capacity commensurately. The ENTSO-E 2017 Mid-term Adequacy Forecast assumes very different levels of reserve requirement between countries/zones in the ENTSO-E area, in terms of MWs as a percentage of peak demand.

2.2.4 A number of options were considered for the allocation of an all-island reserves level to different Locational Capacity Constraint Areas (LCCA). The options presented were:

- Option 1: Bottom-up approach
- Option 2a: Top-down allocation based on largest single infeed in LCCA
- Option 2b: Top-down allocation pro-rata to minimum MW (as calculated according to the current methodology)

Option 1: Bottom-up approach

2.2.5 In conjunction with the TSOs, the RAs would separately determine the level of reserves required to achieve the target standard in each LCCA, and at an all-island level. In this approach it is the target security standard that would be used to determine the reserves required in each LCCA and at the all-island level. It should be noted that the sum of the LCCA reserves requirements may not equal the all-island reserves requirement.

2.2.6 This approach provides flexibility to respond to uncertainty around factors such as load growth, outages or other possible issues (uncertainty around the timing of infrastructure development), reacting to maintain a level of reserves required to achieve the target standard in each LCCA and at an all-island level. This approach equally would adjust to purchase less or no reserves in a LCCA if not required to reach the required standard.

Option 2a and 2b: Top-down approach

2.2.7 Firstly a decision is required as to how many MW of reserves to include at the all-island level. This all-island amount is then allocated to the Level 1 areas, Ireland and Northern Ireland, based on the either the largest single infeed (Option 2a) or the current Locational Capacity Constraint methodology for determining minimum MWs (Option 2b).

2.2.8 The consultation (SEM-18-159) provided a summary evaluation of the options and recognised that the RAs envisaged having the power to use their discretion to purchase less or more than

the amount determined (be it with option 1, option 2a or option 2b), this could be due to factors such as uncertainty about load growth, other factors such as known outages or other generic issues.

2.3 SUMMARY OF RESPONSES

2.3.1 The consultation sought responses as to whether reserves should be included in the LCCA minimum MWs for the T-4 CY2022/23 auction and, if so, which of the above options they favoured. All respondents recognised the rationale for including reserves in the T-4 LCCAs, with the vast majority strongly supporting the proposal. However, there was a view given that the priority for reserves should be first and foremost at the all-island level. A summary of the key reasons given for supporting reserves in the T-4 LCCAs are outlined below:

- To ensure the same level of security of supply is met in each area;
- The inclusion of locational capacity constraints in the T-4 auction recognises that there are capacity restrictions between areas and this should be reflected in the allocation of reserves also;
- T-4 Capacity year is 4 years away and therefore there is inherent uncertainty over; future substantial demand growth, significant transmission capacity constraints being resolved, a lack of real visibility of interconnector reliability and relative lumpiness of supply all adding to concerns about reserves adequacy;
- Without reserves, there is a risk that the volume of capacity procured would be below the anticipated locational system peak;
- Without reserves, in effect, most or all of the reserves would in practice be procured external to the LCCAs, resulting in the LCCAs having a lower security standard than other areas of the system;
- The loss of a major capacity provider or a transmission circuit within a constraint area potentially has a greater risk on the constraint area compared to the system as a whole;
- Managing plant exit given the change in the T-4 auction format (i.e. displacing an equivalent in-merit capacity if additional capacity is required to satisfy LCCA minimum MW requirement), and also given some capacity is likely to be withheld from the T-4 auction;
- Evidence provided from first T-1 capacity auction (CY2018/19) for which only 36 MWs of capacity was procured above the Dublin LCCA minimum MW requirement; and
- Alignment with wider EU practices.

2.3.1 While it was recognised that the Dublin and Northern Ireland LCCAs need to be addressed in the immediate term, there was a view that emphasised a preference for reserves at the all-island level to reflect that they are a system-wide issue and that the specific issues of the LCCAs should be dealt with through market-based locational signals for the T-4 auction.

2.3.2 Respondents were asked for their views on the options proposed in the consultation paper which included a "bottom up" approach and "top down" approaches.

2.3.3 Option 1 "bottom up" approach was the most favoured with six of the eight respondents favouring this approach. Reasons given for supporting this option were that it took into consideration the specific conditions and characteristics of the LCCA and was a pragmatic and suitably flexible approach. Furthermore, the bottom up approach was viewed as being able to ensure consistency and equality of security of supply for customers in those constrained regions. However, a caution was provided from both those who supported and those who didn't support this approach that there was a greater need of transparency if this approach was to be implemented. Those who did not support this bottom up approach did so on the grounds of transparency concerns and the risk of greater investor uncertainty and a lack of replicability.

2.3.4 The TSOs broadly supported Option 1 "bottom up" approach by targeting an equivalent level of Loss of Load Expectation (LOLE) in each region for the apportionment of reserves. They noted that this is equitable and aligns with the existing Locational Capacity Constraint Methodology. They did make reference that this approach is relatively straightforward for the Level 1 constraint areas (currently Ireland and Northern Ireland) but that the exact same approach for the Level 2 constraint area (Dublin) is not possible. Therefore, they proposed that the amount of reserves for the Level 1 Ireland constraint area should be allocated between Ireland (Level 1) and Dublin (Level 2) areas using the same ratio that the existing Locational Capacity Constraint Methodology determines as the minimum MW requirement for these Level 1 and Level 2 constraint areas.

2.3.5 Option 2a "top down" approach based on Largest Single Infeed was not supported by any respondent.

2.3.6 Option 2b "top down" approach based on current minimum MW allocation derived from the existing Locational Capacity Constraint Methodology was favoured by two of the eight respondents. They supported this option on the grounds of simplicity and transparency and thereby giving investor and industry greater certainty. One respondent only favoured this approach on a temporary basis i.e. only for the upcoming T-1 and T-4 auctions as in their view the inclusion of reserves would happen first and foremost at the all-island capacity requirement level and therefore on an enduring basis the inclusion of reserves in future auctions should be incorporated within the capacity requirement methodology.

2.3.7 The concerns given by respondents, in respect of both the "top down" options, included; the risk that they would not provide an appropriate level of reserves to ensure consistency of security of supply for customers and that such a rules-based approach ignores the reality of significant local capacity constraints.

2.3.8 Some respondents provided their view as to how much should be included for reserves in the T-4 auction, such as:

- At least 250 MW all-island;
- At least 500 MW all-island to ensure target security standard is achieved and to cover the all-island Largest Single Infeed reserves requirement.

2.4 SEM COMMITTEE RESPONSE

2.4.1 The SEM Committee agrees with the majority of respondents who argue that reserves should be included at LCCA level in the T-4 auctions.

2.4.2 In the CRM T-4 parameters decision (SEM-18-155), the SEM Committee noted that:

- As a rule of thumb, the TSOs have stated that they will undertake demand control actions when available reserves fall to 100MW in excess of demand across the island; and
- This fact was not reflected in the calculation of capacity required to achieve an 8-hour LOLE standard across the island, according to the TSOs' current methodology.

2.4.3 Following further consideration, the TSOs have also advised that, as "rules of thumb" they are also likely to undertake demand control actions, if:

- In the Level 1:1 Northern Ireland LCCA, the available reserves fall within 50MWs of demand at any given time;
- In the Level 1:2 Ireland LCCA, the available reserves fall within 100MWs of demand at any given time.

2.4.4 These demand control actions are not currently reflected within the Locational Capacity Constraint methodology which the TSOs use for calculating the minimum MWs for Level 1 LCCAs. Therefore, some measure of reserves needs to be added to the Level 1 Northern Ireland and Level 1 Ireland minimum MWs respectively.

2.4.5 Additionally, the SEM Committee notes that the CRM design employs a sloping all-island demand curve, but does not employ a sloping demand curve for LCCAs. This means that whilst the sloping demand curve may deliver capacity in excess of the Capacity Requirement at the all-island level, the same mechanism does not apply at LCCA level. As mentioned within the responses, the absence of adding reserves requirements to the LCCA minimum MW, means that reserves are likely to be added outside key constrained LCCAs. This strengthens the case for including reserves within the LCCA minimum MWs.

2.4.6 The SEM Committee agrees with those respondents who state that:

- In reflecting reserve requirements, the SEM Committee should seek to support equality of security of supply impact across different parts of the island; and
- A "bottom-up" approach is the most appropriate way of supporting equality of security of supply. Evidence provided by the TSOs suggests that neither of the top-down approaches equalise security of supply.

2.4.7 The SEM Committee also notes that the current methodologies applied to calculate the all-island Capacity Requirement and Level 1 LCCA minimum MWs are "bottom-up" approaches. The Northern Ireland, Ireland and all-island requirements are calculated in such a way that the sum of the Northern Ireland and Ireland requirements are more than all-island requirements (by 170MWs in CY2018/19 for example).

2.4.8 The key factors that should be taken into account in estimating bottom-up reserves requirements include:

- At a minimum, the additional reserves should cover the jurisdictional demand control thresholds in Ireland and in Northern Ireland; and
- The addition of reserves should generally seek to support the security standards across the island, notwithstanding the fact that the Level 2 LCCA (Greater Dublin) methodology differs from the all-island and Level 1 methodologies;
- The "bottom-up" approach should take account of specific locational risk factors not otherwise recognised in the existing methodology, which may apply from time to time, to the extent that they are known at the T-4 stage.

2.4.9 The SEM Committee notes that the existing methodology for calculating Level 2 minimum MWs is not based upon an explicit LOLE standard, and differs from the all-island and Level 1 LCCA methodologies which are based on an explicit 8-hour standard. This means that a different approach needs to be applied to determining how many MWs of reserves should be added to the current Level 2 LCCA i.e. Greater Dublin. The SEM Committee has decided to accept the TSOs' recommendation in their response, that as a "rule of thumb" the best way to achieve equality of outcome is to allocate a proportion of the LCCA Level 1 Ireland reserves to Level 2 Greater Dublin LCCA, pro-rata to the minimum MWs in each area.

2.4.10 However, further adjustments may be appropriate to achieve equality of outcome on an ad hoc basis, based on any risks specific to a Level 2 LCCA at any given time.

2.4.11 It is worth noting that within the T-4 parameters decision (SEM-18-155) the SEM Committee stated their intent to make their decision on the amount of capacity to withhold, both at an all-island level and at the LCCAs, in quarter 1 2019 when finalising the T-4 Final Auction Information Pack.

2.4.12 The T-4 CY2022/23 final demand curve and LCCA minimum MWs will be determined, finalised and published early March 2019 and therefore the final decision as to the amount of reserves to apply will be made then, in conjunction with other relevant decisions such as, the amount of withholding capacity and any known factors or risk mitigating adjustments specific to the T-4 CY2022/23 auction.

2.4.13 A Capacity Market Code modification (CMC_14_18 LCC MW Limits) was raised to allow the SEM Committee, if necessary, to use its power to direct the TSOs to make adjustments to the LCCA minimum MW to include the appropriate level of reserves. This modification is due to be effective 30 November 2018.

2.4.14 For future T-4 capacity auctions the proposed level of reserves will be considered in the corresponding parameters consultation for each specific T-4 auction.

2.5 SEM COMMITTEE DECISIONS

2.5.1 The SEM Committee has decided, for the first T-4 auction (CY2022/23), to include a measure of reserves in the all-island demand curve, and to include a measure of reserves in the Level 1 and Level 2 LCCA minimum MWs.

2.5.2 The SEM Committee has decided to use the "bottom-up" approach (Option 1) to calculating the additional reserves to be added into the demand curve at an all-island level, and the LCCAs minimum MW. The key factors to be taken into account in the bottom-up approach include:

- At a minimum, the additional reserves should cover the jurisdictional demand control thresholds;
- The "bottom-up" approach may include such ad hoc adjustments to all-island and LCCA minimum MW, as the SEM Committee may deem appropriate to mitigate specific locational risk factors that may apply from time to time, to the extent that they are known at the T-4 stage.

2.5.3 The Capacity Requirement for T-4 CY2022/23 has already been published in the T-4 CY2022/23 Initial Auction Information Pack (IAIP)[2]. The Capacity Requirement informs the demand curve which will be finalised in the Final Auction Information Pack (FAIP) due to be published early March 2019, therefore the SEM Committee can make adjustments to the T-4 CY2022/23 auction demand curve as if reserves had been included in the all-island Capacity Requirement.

2.5.4 For future T-4 capacity auctions the proposed level of reserves will be considered in the corresponding parameters consultation for each specific T-4 auction.

[2] http://lg.sem-o.com/ISEM/General/Initial%20Auction%20Information%20Pack_IAIP2223T-4.pdf

3. INCLUSION OF RESERVES IN CY2019/20 T-1 AUCTION

3.1 INTRODUCTION

3.1.1 The SEM Committee also proposed including a measure of reserves in the transitional auctions, including the CY2019/20 T-1 auction, both at an all-island and LCCA level. The key reasons are:

- The desire to ensure that at least an 8-hour standard will continue to be achieved through the transitional period, including in LCCAs;
- The desire to continue to manage exit; and
- To account for T-1 specific factors.

3.2 CONSULTATION SUMMARY

3.2.1 The rationale for achieving an 8 hour standard is also applicable to the T-1 CY2019/20 capacity auction to reflect that in practice the TSOs are likely to take demand control actions when available capacity is slightly more than demand, to manage the otherwise likely occurrence of involuntary load shedding.

3.2.2 There may also be a case for including a measure of reserves in the all-island Capacity Requirement later in the transitional period (CY2018/19 to CY2021/22), as the interim design features fall away or diminish during the transitional period. These interim design features include the decision to procure additional capacity in respect of transmission constraints, and also the effect of using the CY2021/22 demand forecast to calculate the Capacity Requirement for all transitional years being diminished in later transitional auctions.

3.2.3 The inclusion of a measure of reserves in the LCCA minimum MW proposed to commence with the T-1 CY2019/20 auction, would provide a further degree of insurance by managing exit of plant in LCCAs that may not be needed during the transitional period, but may be needed in future years if transitional constraints persist. This reflect a number of changes in circumstances such as:

- Some transmission reinforcement projects, such as the North-South interconnector having been delayed and now not expected to be completed until 2023;
- The new demand forecasts for Ireland, particularly relating to the Greater Dublin area, predict considerably higher growth than the old forecasts on which previous analysis was based. This is largely driven by the high predicted growth of data centre demand in some scenarios;
- More is known about new transmission connecting capacity in the pipeline for the next few years; and
- While at an All-Island level, the potential new entry pipeline looks healthy, there may be a need to continue to manage exit in certain LCCAs a little further beyond the end of the transitional period. This may prove to be an unnecessarily conservative approach if there is a significant increase in the volume of embedded generation/storage in the LCCAs and/or an increase in DSU capacity in LCCAs. Indeed,

if the growth in demand is driven by large data centres, it may be the case that the new load will be well placed to physically back DSU capacity.

3.2.4 The current Capacity Requirement and LCCA minimum MW methodology applies assumptions such as long-term historical averages for planned and forced outage rates which are more appropriate for the T-4 timescales when specific details of planned outages are not predictable. However, in T-1 timescales, much more detail about specific planned outage programmes are likely to be known for which the current methodologies do not take into account. This might include for example:

- Specific one-off upgrades to meet tightening environmental restrictions;
- Timing of major overhaul in any given year;
- Uncertainty from events at short notice. These could be unknown events such as outages/faults etc, or known events but for which timing may be uncertain (e.g. delivery of planned infrastructure); and
- Other known outages which may vary from the norm.

3.2.5 These variations from statistical norms may be more pronounced at the LCCA level rather than at the All-island level. In principle, such effects could be reflected in an adapted methodology. For the CY2020/21 transitional auction, the methodology may be adapted to take account of all known information. However, given the imminence of the T-1 CY2019/20 auction, it may not be possible for the TSOs to adapt their models and re-run their analysis on this basis, in time. Therefore, the SEM Committee acknowledges the need to make some ad hoc adjustments to take account of specific factors which may affect particular LCCAs.

Calculating Reserve Requirements for T-1 CY2019/20 auction

3.2.6 The consultation recognised that, from an all-island perspective, there are substantially different circumstances applying to the T-1 CY2019/20 (compared to the T-4 CY2022/23) due to the presence of significant excess capacity at the all-island level. Therefore the T-1 CY2019/20 auction is likely to deliver more than sufficient capacity (including reserves) across the island without the need for significant further adjustments. Including significant additional reserves at an all-island level could add to cost (by pushing the demand curve out) without significant benefits in terms of reduced unserved expectation.

3.2.7 As can be seen from the above, there are many reasons for the inclusion of a measure of reserves in the T-1 CY2019/20 auction relating to security of supply at the Locational Capacity Constraint Area level rather than at the all-island level.

3.2.8 Therefore the SEM Committee consider there to be a strong case for using a “bottom-up” approach in the T-1 CY2019/20 auction, which may also need to be subject to further adjustments for LCCA T-1 specific factors, which are not taken account of in the current LCCA minimum MW methodology.

3.2.9 Decisions made from this consultation may impact the demand curve and the locational capacity constraint minimum MWs and therefore the final numbers will be reflected in the T-1 CY2019/20 Final Auction Information Pack due to be published on 30 November 2018.

3.3 SUMMARY OF RESPONSES

3.3.1 The consultation sought responses as to whether reserves should be included in the forthcoming T-1 capacity auction for CY2019/20. Feedback was also sought on whether to include reserves at an all-island level or at an LCCA level or both, and if so, which approach they favoured and whether the approach should differ from that applied to the T-4 CY2022/23 capacity auction.

3.3.2 All respondents supported the inclusion of reserves within the T-1 capacity auction. Key reasons given for their support are outlined below:

- Concerns with the ability of maintaining an 8-hour LOLE security standard level without reserves procurement in the near term;
- The upcoming T-1 auction is a transitional auction and therefore the inclusion of reserves provides a glide path to Capacity Year 2022/23 (being the end of the transitional period) and helps manage to avoid unwarranted plant exit;
- Necessary due to the significant revision in demand forecast (Generation Capacity Statement 2018-2027) which is not currently reflected in the T-1 CY2019/20 parameters published in the Initial Auction Information Pack;
- To account for known exceptional outages (one-off upgrades, major overhaul timings), most recent generator performance, delivery risk and up to date changes to the portfolio;
- Current increases in demand and uncertainty, a lack of real visibility of interconnector reliability and relative lumpiness of supply all add to concerns about reserves adequacy;
- Consistency with the T-4 auction in terms of inclusion of reserves;
- Alignment with wider EU practices.

3.3.3 A mixed response was received to the suggestion that there was a relatively weak case for including significant reserves at the all-island level in this T-1 auction. Views received included:

- From a principle perspective it was considered correct and better to include reserves at the all-island level, and limit regulatory risk;

- Emphasis that reserves should be first and foremost applied to the all-island requirement to allow the market to try to solve on an unconstrained basis first and ideally the LCCA specific circumstances addressed using market based locational investment signals;

- From an adequacy perspective and to ensure equitable outcomes, the most important consideration is for the appropriate measure of reserves to be included in the Locational Minimum MW requirement, therefore the case is less urgent at an all-island level;

- Given the current environment of considerable uncertainty over demand levels, uncertainty over interconnector reliance and inherent lumpiness of the all-island system, reserves should be included at an all-island level; and
- Outside of LCCAs there is little case for reserves and therefore correct exit signals should be given to surplus capacity.

3.3.4 Respondents were asked for their views on the options proposed in the consultation paper which included a "bottom up" approach and "top down" approaches. Their response for the T-1 auction was very similar to that received for the T-4 auction above.

3.3.5 Option 1 "bottom up" approach was the most favoured with six of the eight respondents favouring this approach. Reasons given for supporting this option were that it took into consideration the specific conditions and characteristics of the LCCAs and was a pragmatic and suitably flexible approach. However, a caution was provided from both those who supported and those who didn't support this approach that there was a greater need of transparency if this approach was to be implemented. Those who did not support this bottom up approach did so on the grounds of transparency concerns and the risk of greater investor uncertainty and a lack of replicability.

3.3.6 The TSOs broadly supported Option 1 "bottom up" approach by targeting an equivalent level of Loss of Load Expectation (LOLE) in each region for the apportionment of reserves. They noted that this is equitable and aligns with the existing Locational Capacity Constraint Methodology. They did make reference that this approach is relatively straightforward for the Level 1 constraint areas (currently Ireland and Northern Ireland) but that the exact same approach for the Level 2 constraint area (Dublin) is not possible. And therefore they proposed that the amount of reserves for the Level 1 Ireland constraint area should be allocated between Ireland (Level 1) and Dublin (Level 2) areas using the same ratio that the existing Locational Capacity Constraint Methodology determines as the minimum MW requirement for these Level 1 and Level 2 constraint areas.

3.3.7 Option 2a "top down" approach based on the Largest Single Infeed was not supported by any respondent.

3.3.8 Option 2b "top down" approach based on current minimum MW allocation derived from the existing Locational Capacity Constraint Methodology was favoured by two of the eight respondents. They supported this option on the grounds of simplicity and transparency and thereby giving investors and industry greater certainty. One respondent only favoured this approach on a temporary basis i.e. only for the upcoming T-1 and T-4 auctions as in their view the inclusion of reserves would happen first and foremost at the all-island capacity requirement level and therefore on an enduring basis the inclusion of reserves in future auctions should be incorporated within the capacity requirement methodology.

3.3.9 The concerns given by respondents, in respect of both the "top down" options, included; the risk that they would not provide an appropriate level of reserves to ensure consistency of security of supply for customers and that such a rules-based approach ignores the reality of significant local capacity constraints.

3.3.10 All respondents did not consider there to be a need to apply different approaches for the T-1 auction and the T-4 auction. The same principles should be applied to both for reasons of consistency and transparency. However some respondents noted that for the T-1 auction, in recognition of known factors, such as recent generator performance, delivery risk, known exceptional outages and up to date changes to the portfolio further adjustments, may be required to the level of reserves applied. This may lead to an upward or downward adjustment.

3.3.11 Some respondents provided their view as to how much should be included for reserves in the T-1 auction, such as:

- Less than 350 MW all-island;
- At least 500 MW all-island to cover the all-island Largest Single Infeed.

3.4 SEM COMMITTEE RESPONSE

General principles for T-1 CY2019/20 transitional auction

3.4.1 The SEM Committee notes that generally, the respondents support:

- The inclusion of reserves in the T-1 transitional auctions, both at all-island and LCCA level; and
- The use of the "bottom-up" approach to calculate the level of reserves at LCCA level in the transitional T-1 auctions.

3.4.2 The SEM Committee sees a strong case for the inclusion of additional allocations of reserves to LCCAs using a "bottom-up" approach, which takes into account factors specific to each LCCA. Due to diversification effects, the appropriate all-island reserves addition may be different to the sum of the reserves required in Northern Ireland and Ireland Level 1 LCCAs separately.

3.4.3 The SEM Committee is of the view that, at a minimum, the level of reserves at the all-island level and LCCA level should reflect the levels at which the TSOs would consider taking demand control actions on an all-island basis, and separately in the two jurisdictions of Northern Ireland and Ireland, which coincide with the definition of LCCAs. The TSOs consider that, as a "rule of thumb", demand control actions would be taken when the available all-island capacity falls to around 100MW within all-island demand, and the SEM Committee recognises that this is grounds for ensuring that at least an additional 100MW of capacity is procured, to ensure that incidences of unserved energy do not exceed an average of 8 hours per annum. However, this does not necessarily imply that the 100MWs of reserves should be added to the all-island Capacity Requirement where the SEM Committee expects this T-1 auction to deliver the required level of reserves anyway. Further additions to the all-island requirement will likely lead to increases in the cost to consumers which outweigh the benefits in terms of reduced unserved energy.

3.4.4 Furthermore, the TSOs have indicated that they are likely to undertake demand control actions separately, particularly in the absence of the North South Interconnector:

- In Ireland, if the level of available capacity in Ireland falls to within 100MW of demand within Ireland; and
- In Northern Ireland, if the level of available capacity in Northern Ireland falls to within 50MW of demand within Northern Ireland.

3.4.5 The SEM Committee notes that it is therefore appropriate to add 100MWs to the Level 1 Ireland LCCA minimum MWs and 50MWs to the Level 1 Northern Ireland LCCA minimum MWs to support that no more than 8 hours p.a. of unserved energy occur on average. The all-island Capacity Requirement is translated into a sloping all-island demand curve, which allows for more all-island capacity being procured when the offer prices are lower, as was the case in the T-1 CY2018/19 capacity auction. However, the sloping demand curve only applies at an all-island level and not at the LCCA levels, so the 100 / 50 MW of additional reserves should be incorporated in the LCCA minimum MWs.

3.4.6 The SEM Committee also notes that there are more likely to be more specific known factors at the T-1 stage, compared to the T-4 stage, which differ or are not reflected in the statistical norms within the capacity requirement and locational capacity constraint methodologies. Therefore more adjustments may be necessary at the T-1 stage than T-4 stage.

3.4.7 As the timing of this decision paper coincides with the publication of the T-1 CY2019/20 Final Auction Information Pack, more information can be provided as to the adjustments considered necessary by the SEM Committee to the base level of reserves given above both for each LCCA and at the all-island level.

Specific circumstances for T-1 CY2019/20 auction

All-island

3.4.8 The SEM Committee recognises the points made by respondents about managing exit, and the demand growth reflected in the recently published Generation Capacity Statement 2018 – 2027 (GCS 2018). The SEM Committee will make a separate adjustment to the all-island demand curve so as the most up to date demand forecast within the recently published GCS 2018 are reflected in the amount of capacity to be procured in this forthcoming T-1 capacity auction.

3.4.9 The qualification process for the CY2019/20 auction is now complete, and the results of the qualification and Exception Application process allows for an informed decision on the need for inclusion of reserves at an all-island level. Similar to the T-1 CY2018/19 capacity auction, there is potential for more capacity to be contracted than the Capacity Requirement, due to:

- The volume of capacity that will be bound by the Existing Capacity Price Cap (ECPC), combined with the continued use of a sloping demand curve, which procures more capacity than the Capacity Requirement when offer prices are less than Net Cost of New Entry (Net CONE); and

- The fact that auction format allows for additional capacity to be procured in this T-1 CY2019/20 in respect of transmission capacity constraints.

3.4.10 For these reasons, the SEM Committee sees no need to adjust the T-1 CY2019/20 all-island demand curve to include any measure of reserves.

LCCA level

3.4.11 The CRM design employs a sloping all-island demand curve, but does not employ a sloping demand curve for LCCAs. This means that whilst the sloping demand curve may deliver capacity in excess of the Capacity Requirement at the all-island level, the same mechanism does not apply at LCCA level.

3.4.12 The SEM Committee believes that the T-1 LCCA reserves additions should:

- Take into account the demand control "rules of thumb" used by the TSOs, and add 50MW of additional reserves for this reason in Northern Ireland and 100MWs of reserves in Ireland; and
- Take into account a specific requirement for known emissions restrictions that apply in the CY2019/20 T-1 timescales, and add a further 120MW of reserves in Northern Ireland as a result.

3.4.13 The UK opted to apply a Trans-National Plan (TNP) under the Industrial Emissions Directive (IED), and the existing TNP ends at the end of June 2020. The ending of the UK TNP is expected to result in the reduction in capacity of certain Northern Ireland plant from July 2020 onwards, and the loss of around 120 MW of de-rated capacity overall in Northern Ireland. This is a form of capacity "exit[3]" which needs to be managed during the CRM transitional period, when new entry is less likely. It is necessary to include an additional 120MW of reserves in Northern Ireland in the CY2019/20 auction to ensure that an exit signal is not sent to 120MWs of Northern Ireland capacity that is expected to be required in CY2020/21 and CY2021/22, if some of the capacity contracted in CY2019/20 has to "exit" to comply with emissions legislation.

3.4.14 Ireland also has its own TNP which comes to an end in June 2020, but unlike in Northern Ireland the ending of the Ireland TNP is not expected to have any effect on the availability of capacity in Ireland.

3.4.15 The SEM Committee does not consider it necessary for T-1 CY2019/20 to include any additional reserves to Level 2 Dublin LCCA in addition to the 100 MW reflecting demand control actions. This reflects what SEM Committee consider appropriate using latest information such as capacity qualified in the Dublin LCCA and the LCCA minimum MWs resulting from the existing LCCA methodology.

3.4.16 As illustrated in **Table 1** below, the net result of these decisions is that the T-1 CY2019/20 auction will include an additional 170MW of reserves in Northern Ireland and 100MW of reserves in Ireland. This will ensure that at a minimum, 270MW of reserves is delivered across

[3] Although no unit close, it leads to the loss of MWs, so is a form of "exit"

the island, although with the presence of the all-island demand curve, there is the potential for more capacity to be procured.

Table 1: Summary of T-1 CY2019/20 reserves

Area	To cover demand control actions	Emissions Regulation	Total
All-island	None - requirement can be met without further additions		
Level 1:1 Northern Ireland	50	120	170
Level 1:2 Ireland	100	0	100
Level 2:1 Greater Dublin	0	0	0
Implied minimum all-island value	150	120	270

3.4.17 A Capacity Market Code modification (CMC_14_18 LCC MW Limits) was raised to allow the SEM Committee, if necessary, to use its power to direct the TSOs to make adjustments to the LCCA minimum MW to include the appropriate level of reserves. This modification is due to be effective from 30 November 2018 and therefore can be applied to the T-1 CY2019/20 auction.

3.4.18 For future T-1 capacity auctions the proposed level of reserves will be considered in the corresponding parameters consultation for each specific T-1 auction. Similar to the approach taken for T-1 CY2019/20 the SEM Committee may make further adjustments, if any locational specific risks are identified after the issue of the T-1 auction specific parameters decision. This will be carried out when finalising the amount to be procured within the Final Auction Information Pack for each specific T-1 auction.

3.5 SEM COMMITTEE DECISIONS

3.5.1 The SEM Committee has decided to include a measure of reserves in the forthcoming T-1 CY2019/20 transitional auction.

3.5.2 The SEM Committee has decided to use the "bottom-up" approach (Option 1) to calculate the additional reserves to be added to the all-island demand curve and the LCCA minimum MWs in this forthcoming T-1 auction. The "bottom-up" approach will take into account the following principles:

- It should, at a minimum, seek to ensure that the jurisdictional thresholds for demand control actions, in Northern Ireland and in Ireland are met;
- Where possible, the SEM Committee will seek to ensure that the addition of reserves seeks to equalise the security standard across the island;
- The allocation will take appropriate account of specific factors that may affect particular LCCAs differently from time to time, and which are known at the T-1 stage; and
- The allocation may be adjusted to reflect other specific information that the SEM Committee has from time to time that may impact on I-SEM criteria.

3.5.3 Given the timing of this decision paper and the T-1 Final Auction Information Pack the SEM Committee are able to set out the final numbers to apply for the T-1 CY2019/20 auction.

3.5.4 For the T-1 CY2019/20 the specific factors which will be reflected in the allocation of reserves in the T-1 auction are:

- All-island: No additional reserves;
- Level 1:1 Northern Ireland: 170 MW of additional reserves, in addition to the volume calculated according to the existing LCCA minimum MW methodology. This consists of 50MWs to cover demand control actions, and 120MW to manage known emissions restrictions;
- Level 1:2 Ireland: 100 MW of additional reserves, in addition to the volume calculated according to the existing LCCA minimum MW methodology, to cover demand control actions; and
- Level 2:1 Greater Dublin. No additional reserves.

3.5.5 The capacities to be procured will be updated to reflect the recently published Generation Capacity Statement 2018 – 2027 recognising the Capacity Requirement set in the IAIP was based on the Generation Capacity Statement 2017 – 2026 forecast. These final requirements will be reflected in the all-island demand curve and the LCCA minimum MWs within the T-1 CY2019/20 Final Auction Information Pack.

3.5.6 For future T-1 capacity auctions the proposed level of reserves will be considered in the corresponding parameters consultation for each specific T-1 auction.

4. NEXT STEPS

4.1.1 The reserves decisions within this paper will be applied to the Final Demand Curve and Locational Capacity Constraint Area minimum MWs contained within the Final Auction Information Packs, which for the T-1 CY2019/20 capacity auction is due to be published 30 November 2018 and 7 March 2019 for the T-4 CY2022/23 capacity auction.

4.1.2 A Capacity Market Code modification (CMC_14_18 LCC MW Limits) associated with this decision has been progressed separately through the urgent modification process and the decision is effective from 30 November 2018.

4.1.3 All SEM Committee decisions are published on the SEM Committee website:

www.semcommittee.com