NOVEMBER 18, 2024

Capacity Auction Enhancements

Capacity Auction Team

Today's Discussion

- Stakeholder feedback from September 18, 2024 engagement
- 2025 Capacity Auction enhancement designs
  - Expanding participation to wind and solar (VG) resources
  - Review of commitment management (CM) options
  - Auction tie-break methodology
  - Administrative updates
- 2024 Capacity Auction updates
- Summary and next steps

Summary of Stakeholder Feedback: September 2024 Session

September Stakeholder Feedback

- The IESO requested participant feedback following the September stakeholder engagement session and two responses were received.
- The IESO's response to stakeholder feedback is posted to the Capacity Auction Enhancements engagement webpage.
- The following slides focus on stakeholder feedback related to design details discussed in today's presentation.

Enhancement Prioritization for 2025 (1/2)

Feedback:

- Stakeholders supported the IESO's prioritized focus on the tie-break solution and believe that the methodology can be implemented for the 2024 auction.

Response:

- The design has been posted for stakeholder review.
- The solution requires internal IESO implementation processes and testing to ensure a seamless and reliable launch after design is completed.

Enhancement Prioritization for 2025 (2/2)

Feedback:

- Stakeholders believe that addressing outstanding questions related to the data submission audit is a key priority to complete in 2025.

Response:

- The IESO understands the concerns from stakeholders regarding the data audit and is considering options to address these concerns. Proposals will be brought forward in a future engagement.

CM Options: Buy-out Charge (1/2)

Feedback:

- Stakeholders proposed an alternate formula that meets the IESO's objective of increasing the buy-out charge while preventing it from being drastically misaligned with similar charges assessed in other jurisdictions.

Response:

- The IESO agrees with the stakeholder proposal and believes it represents a modest increase to the charge amount that is expected to establish a greater incentive for participants to fulfill their commitments while not also creating an incentive to exploit other means to avoid the buy-out process altogether.

CM Options: Buy-out Charge (2/2)

Feedback:

- Stakeholders recommended against increasing prudential requirements since it adds additional financial burden that could be a barrier to participation in the Capacity Auction.

Response:

- The IESO recognizes and understands the concerns around increasing the prudential requirements.
- There will be no changes to the current Capacity Auction prudential requirements under the updated design.
- Please refer to the posted design memo for additional details.

CM Options: New Dispatchable Load Registration

Feedback:

- Stakeholders recommended that only one deposit should be required for an existing non-dispatchable load/physical hourly demand response (HDR) resource that intends to transfer its obligation to a newly registered dispatchable load resource post-auction.

Response:

- In response to previous stakeholder suggestions on this enhancement, the IESO will only require a single deposit for the two Capacity Auction resources in scope of this enhancement.

Expand Participation: Availability Charges

Feedback:

- Stakeholders recommended that the availability charge for VG resources should be based on scheduled capacity, and not offered capacity as proposed.

Response:

- This is a significant departure from current capacity market design and is inconsistent with how the charge is applied to all other resources.
- The appropriateness of such a proposed change would need to be assessed for all resource types, not just VG resources. This is outside the scope of the 2025 Capacity Auction Enhancements work plan. Availability charges will be applied to VG resources in the same manner as they are currently applied to all other resources.

Expand Participation: Qualification Process (1/3)

Feedback:

- Stakeholders requested more details about how a VG resource's demonstrated historical performance would be measured, and how qualification would work for resources with insufficient historical data.

Response:

- Please refer to the posted design memo for additional details about how a VG's demonstrated historical performance is measured. This will also be discussed later in the presentation.
- Resources with insufficient historical data can still participate. Details will be discussed later in the presentation (or refer to the posted design memo).

Expand Participation: Qualification Process (2/3)

Feedback:

- Stakeholders indicated that the IESO should also consider allowing other Capacity Auction resource (CAR) types to use historical meter data, including from emergency activations, in the previous obligation period to demonstrate that the resource can deliver to its cleared ICAP instead of completing a capacity test in each obligation period.

Expand Participation: Qualification Process (3/3)

Response:

- The primary reason for the recommended VG installed capacity (ICAP) submission and assessment process is due to the fuel type, unique characteristics and technical limitations of this resource type, that prevents them from reliably completing the self-scheduled capacity test. In prior feedback, stakeholders also argued that a self-scheduled four-hour capacity test was not appropriate for VG resources, and that historical performance should be used to qualify VG resources.
- The IESO agrees that imposing the current capacity test for VG resources is not appropriate given their characteristics.

Tie-Break Methodology (1/2)

Feedback:

- Stakeholders believe that the high-level design may incentivize virtual HDR resources to offer capacity equal to the total zonal virtual limit to maximize the amount of capacity that a resource clears in the auction.

Response:

- The IESO recognizes that this could be a possible outcome under the high-level design as presented at the September engagement.
- Design updates to mitigate this situation have been considered in the design. Please refer to the posted design memo for more details.

Tie-Break Methodology (2/2)

Feedback:

- Stakeholders indicated that the tie-break solution needs to consider the outcome of a resource's resulting capacity being less than 1 MW, and thus being ineligible to participate in the Capacity Auction.

Response:

- The auction engine optimization cannot result in awarding an obligation of less than 1 MW due to the existing minimum participation requirements in the IESO-administered market.
- For this reason, the tie-break solution will not allocate capacity to a tied offer if doing so results in a total capacity obligation of less than 1 MW.

2025 Capacity Auction Enhancements

Capacity Auction Participation Model Design for Wind and Solar (VG) Resources

Enhancement Objective

- With forecasted demand expected to increase over the next several years, the IESO will continue to leverage competition through various Resource Adequacy Framework mechanisms to secure adequate supply in a cost-effective manner.
- The IESO is preparing a number of competitive opportunities for existing wind and solar resources to extend operations for facilities that are approaching the end of their contracts, including enabling future Capacity Auction participation.
- Expanding participation to VG resources can introduce greater competition and liquidity and allow these resources to continue to provide system value and contribute to grid reliability.

Capacity Qualification Design Updates (1/2)

Design updates made since the September engagement session are included below and outlined in Design Memo 2.0. These updates are the result of stakeholder feedback and additional internal consideration.

- VG submitted ICAP values are limited to a resource's maximum 1-hour seasonal capability demonstrated in a historical performance assessment
  - Participants submit an ICAP value accompanied by allocated quantity of energy injected (AQEI) data over a 1-hour period (twelve consecutive 5-minute intervals) from within the availability window of the most recent applicable seasonal obligation period for which data is available, to demonstrate the resource's maximum capability.
  - The IESO will review and verify this data as part of the capacity qualification process.

Capacity Qualification Design Updates (2/2)

- Submitted ICAP values for VG resources with insufficient historical performance assessment data will be limited to the lower of the resource's nameplate capacity or the resource's most recent IESO-contracted ICAP value.
- Availability De-Rating Factors (ADF) for VG resources with less than five years of historical data will be calculated using zonal totals and wind/solar fleet-wide values.

Settlement Design Updates

Design updates made since the September engagement session are included below and outlined in Design Memo 2.0

- CT 1315 Capacity Obligation – Availability Charge will be calculated and applied to variable generation resources
- A number of existing Capacity Auction charge types will not be applicable to variable generation resources as outlined in design memo section 1.5

Example: VG Capacity Qualification Assessment (1/4)

The approach to qualifying capacity for all resources, including variable generation, is generalized as follows:

UCAP = ICAP x Availability De-Rating Factor x PAF

Where:

- UCAP (unforced capacity) is the maximum amount, in MWs, that a resource is qualified to offer into the Capacity Auction.
- ICAP (installed capacity) should reflect the maximum capability, in MWs, of a resource under ideal operating conditions.
- Availability De-Rating Factor (ADF) is based on a resource's historical contribution and availability data.
- PAF (Performance Adjustment Factor) is based on a resource's assessed performance during a previous seasonal capacity test.

Example: VG Capacity Qualification Assessment (2/4)

- VG submitted ICAP values are limited to the resource's 1-hour maximum capability demonstrated within the availability window of the most recent applicable seasonal obligation period for which data is available
- ADFs are calculated for individual resources with sufficient historical data
- The following examples will use peak capacity contribution factors (below) from the 2024 APO as a proxy for a resource-specific ADF

Fuel Type	2024 Summer Peak Capacity Contribution Factor (1)	2024 Winter Peak Capacity Contribution Factor (1)
Wind	16%	29%
Solar	19%	0%

(1) Peak capacity contribution factors as per the IESO's Supply, Adequacy and Energy Outlook Module Data

Example: VG Capacity Qualification Assessment (3/4)

Example #1 – Wind Resource (winter)

- Resource nameplate capacity = 100 MW
- Submitted ICAP = 90 MW (resource's max. one-hour demonstrated historical capability)
- ADF = 0.29 (proxy value from 2024 APO)
- PAF = 1.0 (for all VG resources)

UCAP would be calculated as follows:

UCAP = ICAP x Availability De-Rating Factor x PAF

= 90 x 0.29 x 1.0

= 26.1 MW

- 100 MW nameplate wind resource would qualify **26.1 MW** for the winter obligation period

Example: VG Capacity Qualification Assessment (4/4)

Example #2 – Solar Resource (summer)

- Resource nameplate capacity = 100 MW
- Submitted ICAP = 97 MW (resource's max. one-hour demonstrated historical capability)
- ADF = 0.19 (proxy value from 2024 APO)
- PAF = 1.0 (for all VG resources)

UCAP would be calculated as follows:

UCAP = ICAP x Availability De-Rating Factor x PAF

= 97 x 0.19 x 1.0

= 18.4 MW

- 100 MW nameplate solar resource would qualify **18.4 MW** for the summer obligation period

Commitment Management Options Design for 2025 Capacity Auction

Commitment Management Options 2025: Overview

- The four design elements included in the commitment management options enhancement package for the 2025 Capacity Auction are defined in *Capacity Auction Design Memo 1.0*. These include:
    1. Physical-virtual obligation transfers (to/from)
    2. Review of buy-out charge
    3. Review of forfeiture rules
    4. New dispatchable load registration
- In general, this package aims to improve participant management of capacity obligations and reduce instances of unfulfilled commitments.
- The following slides will highlight any changes to the design that was presented at September's engagement.

1. Physical-Virtual Obligation Transfers

- No feedback was received on this item and no changes have been made to the high-level design as proposed in September.
- This item increases the pool of Capacity Auction resources for which transfers can be completed, offering more options for participants to transfer their obligation.
- The IESO acknowledges the request of stakeholders to investigate the feasibility of in-period obligation transfers, and will consider this item for future years under the scope of commitment management options.

2. Review of Buy-out Charge: Update (1/2)

- The IESO initially investigated modifying the buy-out charge to be equivalent to the total availability payments earned across all months of an obligation period.
- After reviewing feedback from July's engagement session and exploring similar charge structures in other capacity markets, the IESO presented a proposal at September's engagement session to modify the buy-out charge to be equivalent to ~80% of the total availability payments.
  - The IESO also considered an increase to Capacity Auction prudential requirements to cover the risk of a participant defaulting on the buy-out charge.
- Taking into account additional stakeholder feedback, the IESO has made further revisions to the buy-out charge design as described on the following slide.

2. Review of Buy-out Charge: Update (2/2)

- The updated design recommends increasing the charge to approximately 50% of the availability payments (existing charge is ~30% of availability payments).
- The revised buy-out charge amount represents a more modest increase than previously proposed, and is expected to provide a greater incentive for participants to fulfill their commitments.
- There will be no changes to the current Capacity Auction prudential requirements.

3. Review of Forfeiture Rules

- No feedback was received on this item and no changes have been made to the high-level design as proposed in September.
- If a participant is unlikely to complete the applicable registration requirements prior to the start of the obligation period, and fails to initiate a buy-out of their obligation, the buy-out process will be automatically applied.
- This item will ensure that all instances of unfulfilled commitments are subject to the buy-out charge process.

4. New Dispatchable Load Registration

- This item aims to formalize a process and will require clarification to market manual 12, but does not include any changes to existing rules.
- The change will also involve modifying the Online IESO system to enable the linkage of the resources together during qualification to ensure that any applicable performance adjustment factors for a resource that has previously participated in the Capacity Auction will be carried over from the existing non-dispatchable load resource to the new dispatchable load resource.
- Additionally, this linkage will only require a single deposit for the two Capacity Auction resources in question.

Capacity Auction Design for Tie-Break Methodology

Recap: Tie-Break Methodology Enhancement

- In recent years, stakeholders have consistently urged the IESO to review the Capacity Auction tie-break methodology and consider improvements to the design, arguing that the current methodology does not allocate capacity appropriately.
- The IESO began exploring a multi-stage tie-break solution, centered around proportionally allocating capacity amongst tied offers to address stakeholder concerns about the existing tie-break solution and to improve competitive auction outcomes. The IESO will aim to implement this enhancement for the 2025 Capacity Auction.

Recap: Current Tie-Break Methodology

- A tie-break occurs when two or more Capacity Auction offers are submitted at the same price for the last available quantity of capacity.
- In these instances, a set of criteria must be used, the tie-break methodology, to select which of the tied offers is awarded the capacity.
- Currently, the Capacity Auction clearing engine selects the offer that was submitted earlier based on its time stamp.

Tie-Break Methodology Proposal

At the September engagement, a high-level overview of the multi-stage approach to breaking a tie was presented that was largely based on implementing a proportional tie-break on the proposed design and further internal analysis has identified two key elements requiring further consideration in the proposed design:

- The treatment of offers flagged as "full"
- The treatment of allocations of less than 1 MW

Full vs Partial Offers

- In the Capacity Auction, offer laminations can be flagged as either full or partial. A full offer flag indicates that the offer lamination cannot be awarded capacity that is less, or 'partial', than the offered amount. A partial offer flag indicates the offer lamination can be awarded a partial amount of the offer.
- The proposed tie-break methodology presented in September's engagement session indicated that it would favour partial offers, because full offers cannot be awarded capacity proportionally.
- The goal of the revised tie-break solution is to award capacity as equitably as possible and avoid creating a disadvantage for capacity that cannot be offered partially.
- For this reason, the steps in the solution have been modified slightly from what was presented in September.

Tie-Break Methodology Proposal

The revised tie-break proposal consists of the following steps:

Step 1

- Determine the equal share of the remaining capacity per offer by dividing the remaining capacity by the number of tied offers. If an offer is less than or equal to that equal share, the offer is awarded its capacity.
- If an offer is greater than that equal share and is flagged full, the capacity is not awarded, and it is not considered further in the tie-break solution.

Step 2

- If capacity remains after step 1, award remaining available capacity proportionally to all tied offers flagged as partial that were not fully allocated in step 1. Determine the proportion based on the offer quantity less the capacity allocated in step 1, rounded down to the nearest 1 decimal place

Step 3

- If capacity remains after step 2, rank the tied offers from earliest to latest timestamp, reflecting the time the offer was submitted in Online IESO. Award the remaining capacity to the offer with the earliest timestamp. If the offer with the earliest timestamp is fully met and there is still capacity remaining, continue allocating capacity in rank order.

Tie-Break Methodology Proposal: Step 1 Example

The remaining capacity is equally split and awarded to the tied offers as follows. If an offer is less than the equal share it will be allocated the offer amount. Any full offers that are greater than the equal share will not be allocated capacity and will not be considered further in the tie-break.

Step 1 Example:

Capacity: 40 MWs

Equal Share: 13.3 MW

Capacity After Step 1: 8.4 MW

	Offer (MW)	**Partial/Full**	**Step 1 Allocation**	**Remaining Offer Capacity**
Offer A	5	Full	5	0
Offer B	25	Partial	13.3	11.7
Offer C	40	Partial	13.3	26.7
Total	**70**		**31.6**	**38.4**

Tie-Break Methodology Proposal: Step 2 Example

Capacity not allocated in step 1 is proportionally allocated to the partial offers that were not fully awarded in step 1. The proportional allocation is the same as was presented in the September engagement (was presented as step 1).

Remaining capacity after step 1: 8.4 MW

	Remaining Offer Quantity After Step 1 (MW)	**Partial/Full**	**Proportion (MW)**	**Step 2 Allocation (MW)**
Offer B	11.7	Partial	2.559375000000000	2.5
Offer C	26.7	Partial	5.840625000000000	5.8
Total	**38.4**		**8.400000000000000**	**8.3**

Tie-Break Methodology Proposal: Step 3 Example

In step 3, any capacity remaining will be allocated in rank order from the earliest to latest timestamp. The solution will end after the third step. Any capacity unallocated after step three will remain unallocated.

	Remaining Offer Quantity After Step 2 (MW)	**Partial/Full**	**Time Stamp**	**Rank**	**Step 3 Allocation (MW)**
Offer B	9.2	Partial	11/27/2024 9:45:32 AM	1	0.1
Offer C	20.9	Partial	11/27/2024 3:30:55 PM	2	0
Total	**38.4**		**8.400000000000000**		**0.1**

Tie-Break Methodology Example

Final Allocation

Capacity: 40 MW

Resource	Offer Price ($)	Offer Quantity (MW)	Full/Partial	Step 1 Allocation (MW)	Step 2 Allocation (MW)	Step 3 Allocation (MW)	Final Allocation (MW
Offer A	50	5	Full	5	0	0	5
Offer B	50	25	Partial	13.3	2.5	0.1	15.9
Offer C	50	40	Partial	13.3	5.8	0	19.1
TOTAL	**-**	**70**	**-**	**31.6**	**8.3**	**0.1**	**40**

Allocations of Less Than 1 MW

The Capacity Auction engine and tie-break methodology allocates capacity in increments as small as 0.1 MW increments. Due to this feature, it is possible that the tie-break results in a total capacity allocation of less than 1 MW.

If the tie-break solution results in a total capacity allocation of less than 1 MW, the capacity will not be awarded due to the minimum participation requirement in the IESO-administered markets of 1 MW. For this reason, the tie-break solution will not allocate capacity to a tied offer if it results in a total capacity obligation of less than 1 MW.

2025 Administrative Updates

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- Standard annual review process to provide clarity on rules and procedures and consider design changes that can improve the efficiency of existing Capacity Auction processes
- Administrative updates typically require amendments to Market Rules and/or Market Manuals, and, in some cases, may require IT changes

2025 Administrative Updates

Item	Description	Reference (MRP Final Alignment)
Clarify SBI Capacity Test Language	Align the procedure for System-Backed Imports with all other resources under the self-scheduled capacity test	MR Ch. 0.7, s.19.9 MM 0.12, s.5.3.5
Review GBI UCAP Methodology	Determine if any updates to IESO's methodology are required based on lessons learned, capacity accreditation developments in other jurisdictions	MR Ch. 0.7, s.18.2A.1.3 MM 0.12, s.3.3.1
Implement Ability to Submit Capacity Test Info via Online IESO	Add user interface to Online IESO for ease of data submission	MM 0.12

Clarify SBI Capacity Test Language

Current: As part of the Capacity Auction capacity test procedure, System-Backed Import (SBI) resources receive a schedule from IESO to import energy

Change: Align the procedure for SBIs with all other resources under the self-scheduled capacity test

Benefit: Greater alignment of capacity test requirements across eligible Capacity Auction resources. Participant can schedule SBI resource test activation during the testing and availability window.

Review GBI UCAP Methodology

Current: To calculate the UCAP for a GBI resource, the IESO applies the 'exUCAP', as determined by the source jurisdiction, to this formula:

$$UCAP = (\text{exUCAP} + \text{esfICAP} \times \textit{availability de-rating factor}) \text{ x } \textit{performance adjustment factor}$$

Where:

(a) '*exUCAP*' is the total equivalent capacity (in MW) for all *generator-backed import contributors* that are *generation facilities*, as determined by the applicable *control area operator* and provided to the *IESO* in accordance with the applicable *market manual;*

Change: As NYISO has changed its methodology to calculate the 'exUCAP' value, determine if any updates to IESO's methodology are required

Benefit: Opportunity to review capacity accreditation developments in other jurisdictions and any lessons learned

Ability to Submit Capacity Test Info via Online IESO

Current: Capacity market participants must notify the IESO of the specific day, hours and dispatch intervals for which they wish their performance to be assessed.

This notification is sent in the form of an email to capacity.auction@ieso.ca with the subject heading, "Capacity Auction Capacity Test: Participant name, Obligation ID".

Change: Add user interface to Online IESO for ease of data submission. The current practice of using email to submit info for the purposes described in MM12 (e.g., outage notification) will no longer apply.

Benefit: Reduced administrative burden; risk of human error is reduced; participants can make edits directly

2024 Capacity Auction Updates:

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- 2024 Capacity Auction:
  - Capacity Qualification
    - Deposit submission window closes Nov. 20, 2024
  - Capacity Auction Offer Submission Window
    - Open from 09:00 a.m. EST on Nov. 27 to 11:59 p.m. EST on Nov. 28
    - Post-Auction Report will be published by 04:00 p.m. EST on December 5

Summary and Next Steps

Next Steps for 2025 Capacity Auction Enhancements

- Any final feedback for IESO to consider on updated designs can be submitted by December 9, 2024
- IESO will consider any final feedback before drafting design element details into proposed market rule and manual amendments that will be presented to stakeholders in Q1 of 2025
- Any design element details that materially deviate from final designs will be brought to stakeholders for input before market rule and manual amendments are submitted for Technical Panel review and approval

Next Steps

- Next engagement session will be in Q1 of 2025
  - Continue engagement on 2025 enhancements and administrative updates
  - Present draft market rules and manuals for 2025 enhancements, including administrative updates
- Using the feedback form provided, stakeholders are invited to submit questions and comments by December 9, 2024 on the following items:
  - 2025 Capacity Auction Enhancements updated designs
  - 2025 Administrative Updates

Thank You

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