



2022 Capacity Auction Enhancements

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Disclaimer

This document is provided for informational purposes only and describes the proposed design enhancements that will be implemented starting with the December 2022 Capacity Auction. The IESO has prepared this document based on information currently available to the IESO and reasonable assumptions associated therewith. The information, statements and conclusions contained in this report are subject to risks, uncertainties and other factors that could cause actual results or circumstances to differ materially from the information, statements and assumptions contained herein. The IESO provides no guarantee, representation, or warranty, express or implied, with respect to any statement or information contained herein and disclaims any liability in connection therewith. The IESO undertakes no obligation to revise or update any information contained in this report as a result of new information, future events or otherwise. Until changes are made to the IESO market rules and market manuals to reflect and implement the proposed design enhancements described in this document, the existing IESO market rules, market manuals, and any relevant policies, standards and procedures, continue to govern.

Introduction

Over the next several years, the IESO will undergo a transitional stage as it operationalizes the Resource Adequacy Framework. To address increasing capacity needs during this time, the annual Capacity Auction will remain a key mechanism in the [Resource Adequacy Framework](#) to secure short-term resource adequacy needs. The Capacity Auction enables the IESO to acquire capacity in a transparent and cost-effective manner and acts as an enduring mechanism that can balance fluctuations in capacity needs from one year to the next. Having a flexible and competitive mechanism that can respond to changing system needs each year delivers significant value to ratepayers and ensures cost-effective reliability.

The first [Annual Acquisition Report](#), issued in July 2021, provided increased business and investment certainty for the market by publishing minimum annual targets and forward guidance on expected overall targets for upcoming annual Capacity Auctions.

In an important milestone for Ontario's electricity sector, the IESO secured 1,286.7 megawatts (MW) of capacity for the 2022 summer obligation period, and 841.9 MW for the winter of 2022-2023 from a broad range of resources in the December 2021 Capacity Auction.

Previous auction results have reinforced the value of this mechanism in meeting short-term needs, and demonstrated why it will continue to be relied upon in the years ahead as our system needs grow. In order to achieve greater competition and improve the performance of participating resources, several enhancements to the existing Capacity Auction have been proposed and developed through discussions with stakeholders throughout 2021 in the [Resource Adequacy stakeholder engagement](#).

This document describes enhancements designed to introduce a capacity qualification process for all participating resources, expand participation and competition in the auction to generator-backed capacity imports and improve availability and delivery performance of participating resources for the December 2022 auction.

Purpose of Design Document

This document describes the design enhancements that will be implemented in the Capacity Auction to be held in December 2022. The purpose of this document is to provide stakeholders and the IESO with a common understanding of the design features that have been introduced, including key design decisions and the rationale. The design enhancements described in this document were developed in consultation with stakeholders in Resource Adequacy engagement sessions held throughout 2021.

The IESO intends to make regular, incremental improvements to the Capacity Auction in future years in response to reliability needs, IESO business needs, lessons learned and stakeholder priorities while accounting for time and resource constraints. Any future enhancements will be discussed with stakeholders in a transparent manner.

Not included in the scope of this document is the more detailed implementation of the design, in terms of specific Market Manual changes and tool/system changes. The IESO will address the implementation aspects of the changes through separate stakeholder engagements.

This document assumes that the reader is familiar with relevant terminology and design features of the existing Capacity Auction, the rules and mechanisms of which will be used as a foundation for the enhancements outlined in the following sections. For more information on the existing Capacity Auction and the current guiding documents, please refer to the [Capacity Auction](#) webpage.

Background

The IESO's first Capacity Auction was held in December 2020, in which approximately 992 MW of capacity, from a diverse range of suppliers, was procured. This inaugural Capacity Auction was developed by expanding the Demand Response Auction, which acquired capacity from demand response resources over five auctions from 2015 to 2019. The annual Capacity Auction will continue to be a key mechanism in the [Resource Adequacy Framework](#) to secure short-term resource adequacy needs outlined in the Annual Planning Outlook and Annual Acquisition Report.

The Capacity Auction is broken down into four major auction periods, as presented with the associated timelines in the figure below.



Figure 1: Capacity Auction Timeline

These auction periods will be referenced throughout this document as the design enhancements are outlined.

Design Principles

The design enhancements for the December 2022 Capacity Auction were developed in accordance with the same guiding principles used for the Market Renewal Program:

- **Efficiency** - focus on efficient outcomes to reduce system costs

- **Competition** - provide open, fair, non-discriminatory competitive opportunities for participants to help meet evolving system needs
- **Implementability** - work together with our stakeholders to evolve the market in a feasible and practical manner
- **Certainty** - establish stable, enduring mechanisms that send clear, efficient price signals
- **Transparency** - accurate, timely and relevant information is available and accessible to participants to enable their effective participation to meet system needs

Summary of Enhancements

The following major design enhancements will be implemented ahead of the December 2022 Capacity Auction:

Capacity Qualification

The IESO plans to adopt a capacity qualification process to derive an Unforced Capacity, or UCAP, value for all resources. Qualifying resources on a UCAP basis is a well-established approach to fairly and uniformly evaluate how much a resource can reliably be expected to provide towards meeting capacity needs during peak periods by accounting for historic availability and performance. A qualified capacity approach also supports the transition to more technology-agnostic procurements. By introducing an IESO-administered capacity qualification process, both the IESO and participants in the auction will have the confidence that the capacity contribution from each resource is being accounted for appropriately using fair and transparent methodologies.

Enhanced Performance Assessment Framework

Updates to the performance assessment framework will incent improved reliability performance from participants in the auction. These enhancements will help to reduce the risk of underperformance from cleared resources during hours of system need while ensuring alignment and fairness from qualification through to assessment.

Expanding Participation to Generator-Backed Capacity Imports

The IESO aims to increase competition and cost effectiveness by facilitating the participation of generator-backed capacity imports. The IESO anticipates being able to facilitate participation from generator-backed capacity imports located in Quebec and New York. Capacity imports from other jurisdictions may be enabled in future years pending further discussions.

Enhancement #1: Capacity Qualification

Key objectives of the Capacity Auction include:

- Procuring capacity in a transparent, open and fair manner; and
- Ensuring that the capacity secured through the auction contributes equally towards meeting resource adequacy needs while considering the unique characteristics of the underlying technology.

To meet these objectives, a capacity qualification process will be used in the pre-auction period of the December 2022 Capacity Auction (and for future auctions) to derive the UCAP value that a resource can offer into the Capacity Auction.

During the pre-auction period, resources that intend to participate in an upcoming Capacity Auction will be required to submit an ICAP value for qualification of each resource (described further in the next section). The IESO will apply the resource-specific capacity qualification methodologies to derive a UCAP value which will represent the maximum megawatt quantity that the resource may offer into the auction.

Capacity Qualification Methodology Overview

The approach to qualifying capacity for all resources is generalized as follows:

$$\text{UCAP (MW)} = \text{ICAP (MW)} \times \text{Availability De-Rating Factor} \times (1 - \text{PAF})$$

Where:

- UCAP (Unforced capacity) is the maximum amount, in MW, that a resource is qualified to offer into the Capacity Auction as an output of the Capacity Qualification process.
- ICAP (Installed capacity, in the context of the Capacity Auction) should reflect the maximum expected capability in MWs of a resource given ambient temperature and operating conditions, as specified by the Capacity Auction Participant.
- Availability De-Rating Factor is based on a resource's historical data.
- PAF is the Performance Adjustment Factor, applicable to an individual resource, as based on assessed performance during historical seasonal capacity test performance assessments.

A resource-specific UCAP value will be determined during the capacity qualification process for each seasonal obligation period (summer and winter). The Capacity Auction Participant can then choose to offer up to the resource's maximum summer and winter UCAP value (or less) into the Capacity Auction. Any resources assessed to have a UCAP below 1 MW will be unable to participate in the auction as the minimum offer quantity a resource may offer into the auction is 1 MW.

Further detail on each component of the capacity qualification process, as well as a chart summarizing the input sources by resource type are in the following sections.

ICAP Values

Seasonal ICAP values for individual Capacity Auction Resources will be submitted to the IESO by the Capacity Auction Participant through Online IESO during the capacity qualification process. It is the responsibility of the resource representative to determine the most appropriate value based on the following guidance:

- Seasonal ICAP values should reflect the maximum expected offer/bid capability of a resource given ambient temperature and operating conditions. However, when submitting the ICAP for a Capacity Auction Resource, the Capacity Auction Participant should account for some uncertainty of these conditions, or generally the ability to achieve this maximum capability, during a capacity test.
- Seasonal ICAP values are expected to be consistent with other data submitted to the IESO through Form 1230 or market registration (if this data set exists).
- It is important to consider that during a capacity test, a resource will be assessed to its cleared ICAP. Capacity charges and Performance Adjustment Factors (as further described below) will be calculated based on a resource's performance as compared to its cleared ICAP.
- For storage resources, ICAP should account for a four-hour energy duration requirement as detailed in the dispatchable storage UCAP methodology, outlined below.

Availability De-Rating Factor

The basis of the Availability De-Rating Factor in the UCAP calculation takes into account the unique operating and participating methods of the resource type. The Availability De-Rating Factor for an individual resource will be calculated per the methodology for the resource type, using one of: equivalent forced outage rate on demand (EFOR_d), the resource's production and scheduled operating reserve data from the top 200 hours of Ontario demand (per season) or the resource's bid data from the top 200 hours of Ontario demand (per season).

The applicability of the availability de-rating factor for dispatchable loads and HDR resources is explained below.

Dispatchable Load

The Availability De-Rating Factor for dispatchable loads will be based on bid data from the most recent comparable season.

Hourly Demand Response (HDR)

The Availability De-Rating Factor for HDR resources is not applicable due to the fact that, under the HDR participation framework, resources only maintain bids through to real-time when on standby. This means there is an insufficient amount of real-time bid and production data to derive an Availability De-Rating Factor. HDR resources will instead be subject to augmented availability charge assessments during times when they have received a standby notification. This approach helps ensure fairness in treatment between HDR and those resources subject to availability de-ratings during capacity qualification. Augmented availability charges are discussed further in this document.

Equivalent Forced Outage Rate on Demand (EFOR_d)

The Availability De-Rating Factor may be based on EFOR_d, which represents the probability that a resource will not be available (completely or in part) during hours the unit is called upon to generate (i.e., during on-demand hours) due to forced outages or forced de-rates. If known, a resource-specific EFOR_d will be used, otherwise a fleet-wide EFOR_d will be applied.

Top 200 Hours of Ontario Demand

The top 200 hours of Ontario Demand per season will be used to assess performance (availability or production) during the roughly 5% of peak hours per year. This sample size represents a good reflection of resource contributions and availability during hours of system peak.

Performance Adjustment Factor

The last variable in calculating a resource's UCAP is the Performance Adjustment Factor (PAF). A resource's PAF will be calculated in the pre-auction period for each season, prior to the annual Capacity Auction. The PAF will be based on performance during the most recent capacity test for which data is available. PAFs will always be calculated pursuant to the performance assessment pass/fail settlement criteria that were in place at the time that the capacity test occurred.

PAFs will not be applied for the 2022 Auction; however, measured performance from the *obligation periods* of the 2022 Auction will be used to derive PAFs for *future* Auctions. For further clarity, PAFs will apply to UCAP calculations beginning with the 2024 auction, using capacity performance data from capacity tests in the summer 2023 and winter 2023/24 obligation periods.

For more details on the data that will be used for PAF calculations and the obligation periods from which that data will be sourced, consult [Appendix A](#).

The table below summarizes the factors to be used in qualifying capacity.

Table 1: Summary of Qualification Inputs

	ICAP	Availability De-Rating Factor	PAF
Dispatchable Thermal Generation	Seasonal ICAP values provided by Capacity Auction Participant during capacity qualification process	EFOR _d value based on five years of historical EFOR _d data	For qualification in the December 2024 Capacity Auction, PAFs will be based on assessed performance from the Summer 2023 and Winter 2023/24 Obligation periods ¹
Dispatchable Hydro		Production data and scheduled operating reserve data that coincides with the top 200 hours of highest Ontario demand per season, over the most recent five years	
Dispatchable Storage		EFOR _d of 5%	
Dispatchable Load		One year of historical bid data that coincides with the top 200 hours of highest Ontario demand per season	
System-Backed Imports		N/A	
Generator-Backed Imports		Accredited UCAP value from external jurisdiction (with exception of storage)	
HDR		No availability de-rate factor applied: Augmented availability charge assessment when on standby in lieu of availability de-rate	

Cleared UCAP and Cleared ICAP

The UCAP calculation determines the maximum amount (in MW) that a resource will be qualified to offer into the Capacity Auction. Once the Capacity Auction has been completed, the resource will then have a Cleared UCAP, which may be equal to or less than their initial UCAP. The Cleared UCAP will then be divided by the Availability De-Rating Factor and the PAF to calculate a corresponding Cleared ICAP. The difference between a resource’s UCAP and ICAP prior to clearing will be proportional to the difference between the cleared UCAP and cleared ICAP. The calculation is as follows:

$$\text{Cleared ICAP (MW)} = \text{Cleared UCAP (MW)} \times [1/(1 - \text{PAF})] \times [1/\text{Availability De-Rating Factor}]$$

The concepts of a Cleared ICAP and a Cleared UCAP are essential for resources to be aware of since:

¹ For new HDR resources, or for HDR resources where this data is not available, a PAF based on the weighted class average will apply

- The resource will be paid based on its Cleared UCAP value
- The resource will be assessed for availability against the Cleared UCAP value
- Capacity test performance assessments will be evaluated against the resource’s Cleared ICAP value

This concept is illustrated below:

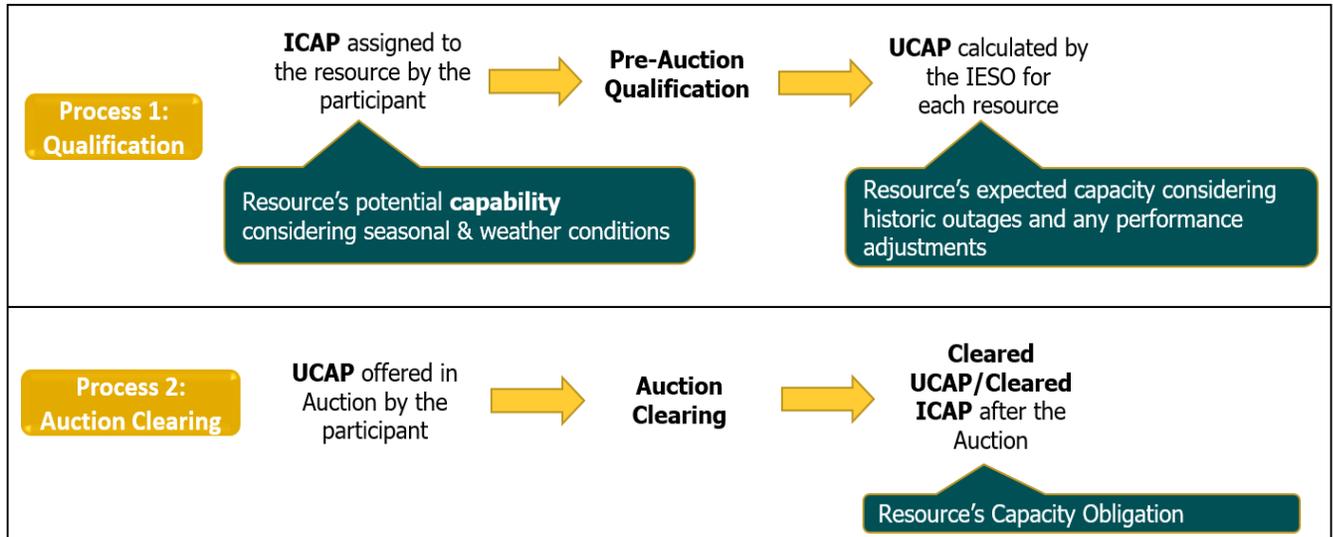


Figure 2: Process Flow for Cleared ICAP & UCAP

The capacity qualification methodology (UCAP calculation) specific to each resource type is explained in more detail in the following subsections.

Dispatchable Thermal Generation

The UCAP formula for dispatchable thermal generation is:

$$\begin{aligned} \text{UCAP (MW)} &= \text{ICAP (MW)} \times \text{Availability De-Rating Factor} \times (1 - \text{PAF}) \\ &= \text{ICAP (MW)} \times (1 - \text{EFOR}_d) \times (1 - \text{PAF}) \end{aligned}$$

Where:

- UCAP is the unforced capacity amount, in MW, that a resource is qualified to offer into the Capacity Auction
- ICAP is the resource’s seasonal capability, in MW, as submitted by the Capacity Auction Participant
- EFOR_d is the equivalent forced outage rate on demand, and
- PAF is the Performance Adjustment Factor, which will be applied in the December 2024 Capacity Auction, based on the assessed performance from Summer 2023 and Winter 2023/24 obligation periods

EFOR_d for dispatchable thermal generation will be an annual EFOR_d value based on five years of historical EFOR_d data established using the existing IESO process. For resources with less than five years of historical data, a proxy value will be used based on the median EFOR_d of the resource fleet.

Example

A dispatchable thermal generator resource registers for the December 2022 Auction with the following attributes:

ICAP: 100MW

EFOR_d: 8%

PAF: Not applicable, PAF will be applied beginning in the 2024 Auction

UCAP would be calculated as follows:

$$\text{UCAP} = \text{ICAP} \times (1 - \text{EFOR}_d) \times (1 - \text{PAF})$$

$$= 100\text{MW} \times (1 - 8\%) \times (1 - 0)$$

$$= 100\text{MW} \times 0.92 \times 1$$

$$= 92\text{MW}$$

Therefore, the resource would be qualified to offer 92 MW into the Capacity Auction.

Dispatchable Hydro

The UCAP formula for dispatchable hydro is:

$$\text{UCAP (MW)} = \text{ICAP (MW)} \times \text{Availability De-Rating Factor} \times (1 - \text{PAF})$$

$$= \text{ICAP (MW)} \times \text{Median} [(\text{AQEI (MWh)} + \text{Scheduled Operating Reserve (MWh)}) / \text{MAPC (MW)}] \text{ in Top 200 hours of Ontario demand per season per year over the last 5 years} \times (1 - \text{PAF})$$

Where:

- UCAP is the unforced capacity amount, in MW, that a resource is qualified to offer into the Capacity Auction
- ICAP is the resource's seasonal capability, in MW, as submitted by the Capacity Auction Participant
- AQEI is the Allocated Quantity of Energy Injected, in MWh
- Scheduled Operating Reserve in MWh
- MAPC is the Maximum Active Power Capability, in MW, under any conditions without station service being supplied by the unit, and

- PAF is the Performance Adjustment Factor, which will be applied in the December 2024 Capacity Auction, based on the assessed performance from Summer 2023 and Winter 2023/24 obligation periods

A seasonal UCAP will be determined using a combination of energy production and scheduled Operating Reserve data from the top 200 hours of highest Ontario demand from each relevant season over the most recent five years of historical data. The historical data, gathered from the IESO’s records of hourly energy injected to the grid and scheduled Operating Reserve in the dispatch schedule, incorporates the impacts of energy limitations, weather limitations and forced outage rates. Therefore, it is expected that the production and scheduled Operating Reserve data of dispatchable hydro facilities will be an accurate reflection of their historical capability.

Example

A dispatchable hydro generator registers for the December 2022 Auction with the following attributes:

ICAP: 100MW

Median [(AQEI + Scheduled Operating Reserve)/MAPC] in top 200 hours of Ontario demand per season per year over the last 5 years: 0.70

PAF: Not applicable, PAF will be applied beginning with the 2024 Auction

UCAP would be calculated as follows:

$$\begin{aligned}
 \text{UCAP} &= \text{ICAP (MW)} \times \text{Median} [(\text{AQEI (MWh)} + \text{Scheduled Operating Reserve (MWh)}) / \text{MAPC (MW)}] \text{ in} \\
 &\quad \text{Top 200 hours of Ontario demand per season per year over the last 5 years} \times (1 - \text{PAF}) \\
 &= 100\text{MW} \times (0.70) \times (1 - 0) \\
 &= 100\text{MW} \times 0.70 \\
 &= 70\text{MW}
 \end{aligned}$$

Therefore, the resource would be qualified to offer 70 MW into the Capacity Auction.

Dispatchable Storage

The UCAP formula for dispatchable storage is:

$$\begin{aligned}
 \text{UCAP (MW)} &= \text{ICAP (MW)} \times \text{Availability De-Rating Factor} \times (1 - \text{PAF}) \\
 &= [\min(\text{Full Power Operating Mode, Energy Rating}/4 \text{ hours})] \times (1 - \text{EFOR}_d) \times (1 - \text{PAF})
 \end{aligned}$$

Where:

- UCAP is the unforced capacity amount, in MW, that a resource is qualified to offer into the Capacity Auction
- Full Power Operating Mode is the temperature-sensitive maximum power rating that can be sustained for 1 hour

- Energy Rating is the temperature-adjusted maximum amount of energy in MWh, that the resource is capable of delivering, when it is fully charged
- EFOR_d is the equivalent forced outage rate on demand
- PAF is the Performance Adjustment Factor, which will be applied in the December 2024 Capacity Auction, based on the assessed performance from Summer 2023 and Winter 2023/24 obligation periods

In determining the qualified capacity, the IESO must consider a resource's sustained capability over a specified time period, in order to level the contribution of different resources towards meeting resource adequacy needs.

The four-hour energy duration requirement used in the Capacity Auction is meant to find a balance between peak system needs, operational flexibility and cost. Additionally, the four-hour duration has been a feature of the Capacity Auction and previous Demand Response Auction.

To align with these considerations, the qualification process for dispatchable storage will consider the resource output that can be sustained for four hours. This means that ICAP will be determined by the lower of maximum power rating or the energy rating divided over four hours. This duration adjusted value will then be de-rated using an EFOR_d. As there is a limited data set available on historical performance for storage resources that have been operating in Ontario, a 5% EFOR_d will be used for all dispatchable storage resources in the 2022 Auction.

Example

A storage resource registers for the December 2022 Auction with the following attributes:

Full Power Operating Mode: 8MW

Energy Rating: 16MWh

PAF: Not applicable, PAF will be applied beginning with the 2024 Auction

EFOR_d: assumed to be 5%

UCAP would be calculated as follows:

$$\begin{aligned}
 \text{UCAP} &= [\min(\text{Full Power Operating Mode}, \text{Energy Rating}/4 \text{ hours})] \times (1 - \text{EFOR}_d) \times (1 - \text{PAF}) \\
 &= [\min(8\text{MW}, 16\text{MWh}/4\text{h})] \times (1-5\%) \times (1 - 0) \\
 &= [\min(8\text{MW}, 4\text{MW})] \times 0.95 \times 1 \\
 &= 4\text{MW} \times 0.95 \times 1 \\
 &= 3.8\text{MW}
 \end{aligned}$$

Therefore, the resource would be qualified to offer up to 3.8 MW into the Capacity Auction.

Dispatchable Load

The UCAP formula for dispatchable load is:

$$\begin{aligned} \text{UCAP (MW)} &= \text{ICAP (MW)} \times \text{Availability De-Rating Factor} \times (1 - \text{PAF}) \\ &= \text{ICAP (MW)} \times \text{Median (Hourly bids quantity / maximum seasonal energy bid quantity)} \\ &\quad \text{in top 200 hours of Ontario demand per season} \times (1 - \text{PAF}) \end{aligned}$$

Where:

- UCAP is the unforced capacity amount, in MW, that a resource is eligible to offer into the Capacity Auction
- ICAP is the resource's seasonal capability, in MW, as submitted by the Capacity Auction Participant
- Maximum seasonal energy bid quantity is the highest energy bid, in MWs, submitted by the resource in the past year
- PAF is the Performance Adjustment Factor, which will be applied in the December 2024 Capacity Auction, based on the assessed performance from Summer 2023 and Winter 2023/24 obligation periods

In this calculation, one year of historical bid data that coincides with the top 200 hours of highest Ontario demand per season will be used. Using a longer period of historical bid data may create distortions due to changing business operations and associated consumption. Historical bids indicate the availability of the resource and are suitable for calculating future availability. For new resources, a fleet-specific class median will be utilized for the availability de-rating factor. This will be based on the median availability de-rating factor applied to all existing dispatchable loads qualified in the Capacity Auction in each season.

Example

A dispatchable load registers for the December 2022 Auction with the following attributes:

ICAP: 100MW

Median of one hourly bids quantity divided by the maximum seasonal energy bid quantity in top 200 hours of Ontario demand that season: 0.98

PAF: Not applicable, PAF will be applied beginning with the 2024 Auction

UCAP would be calculated as follows:

$$\text{UCAP} = \text{ICAP} \times \text{Median (Hourly bids quantity / maximum seasonal energy bid quantity) in top 200 hours of Ontario demand per season} \times (1 - \text{PAF})$$

$$= 100\text{MW} \times (0.98) \times (1 - 0)$$

$$= 100\text{MW} \times 0.98 \times 1$$

$$= 98\text{MW}$$

Therefore, the resource would be eligible to offer 98 MW into the Capacity Auction.

System Backed Capacity Imports

The UCAP formula for system-backed imports is:

$$\text{UCAP (MW)} = \text{ICAP (MW)}$$

Imports from System-Backed Capacity Imports are anticipated to be fully reliable as these are guaranteed by the host system operator and not tied to a specific resource. IESO has established global import limits that, over the next few years, are well below the tie line capabilities and internal transmission constraints. Therefore, although the initial UCAP calculation considered and presented to stakeholders included tie line outage rates, they were deemed to be not applicable. Similarly, because of the guarantee from the host system operator, no de-rating is required.

Example

A system backed import registers for the auction with the following attributes:

ICAP: 100MW

Its UCAP would be calculated as follows:

$$\begin{aligned} \text{UCAP} &= \text{ICAP} \\ &= 100\text{MW} \end{aligned}$$

Therefore, the system-backed import would be eligible to offer 100 MW into the Capacity Auction.

Generator-Backed Capacity Imports

Imports from generator-backed capacity imports are supported or 'backed' by a specific generator in an external jurisdiction. The specific generating resource(s) that is/are backing the capacity import will be assessed during the capacity qualification process to determine a UCAP value.

To align the capacity obligation with the underlying import participation framework, participants with a generator-backed capacity import resource consisting of multiple generation units that are successful in the Auction will receive a single capacity obligation. To determine a single capacity obligation for resources with multiple generation units, each generation unit under the generator-backed capacity import resource will be qualified separately (UCAP determined on a unit level) and then the separate UCAP amounts will be summed together so a single value can be offered into the auction by the participant.

All performance will be evaluated on the single import obligation (e.g. availability assessment at the inertia), but data submissions (e.g. for tests) must be made for each applicable generation unit.

Based on discussions with stakeholders and neighbouring Independent System Operators (ISOs), the IESO will require the external participant to demonstrate that it has received an accredited UCAP rating from an external jurisdiction/balancing authority for any generation resource which it plans to offer into the auction (with the exception of energy storage in which case the energy storage UCAP calculation will apply). In addition, the participant will be required to provide a corresponding ICAP rating for capacity verification/testing purposes.

The UCAP formula for generator-backed capacity imports that are located in a system with an accredited UCAP product is:

UCAP (MW) = External System UCAP accreditation (MW) x (1 – PAF)

Where:

- PAF is the Performance Adjustment Factor, which will be applied in the December 2024 Capacity Auction, based on the assessed performance from Summer 2023 and Winter 2023/24 obligation periods

Example

A generator-backed capacity import with an accredited UCAP product, registers for the December 2022 Auction with the following attributes:

External Accredited UCAP: 15MW

Corresponding ICAP: 16MW

PAF: Not applicable, PAF will be applied beginning with the 2024 Auction

Its UCAP would be calculated as follows:

UCAP = Host System UCAP (MW) x (1 – PAF)

= 15MW x (1 – 0)

= 15MW

Therefore, the resource would be qualified to offer 15 MW into the Capacity Auction.

Hourly Demand Response (HDR)

The UCAP formula for HDR resources is:

UCAP (MW) = ICAP (MW) x (1 - PAF)

Where:

- ICAP is the resource’s seasonal capability, in MW, as submitted by the Capacity Auction Participant
- PAF is the Performance Adjustment Factor, which will be applied in the December 2024 Capacity Auction, based on the assessed performance from Summer 2023 and Winter 2023/24 obligation periods

The IESO will always derive a PAF based on the performance assessment pass/fail settlement criteria in place at the time of the test activation starting with the 2023 Summer Obligation period. For new HDR resources or HDR resources for which test data is not available, a fleet-specific weighted class average PAF from the most recent obligation period for which data is available, based on the obligation type (physical HDR, virtual HDR commercial and industrial, or virtual HDR residential) will be utilized. The methodology for determining a weighted class average for capacity qualification of new HDR resources is described in [Appendix B](#).

Example

A physical Commercial and Industrial (C&I) HDR resource registers for the December 2024 auction with the following attributes:

ICAP = 100MW

During the summer obligation period of the December 2022 Auction (May 1, 2023 to October 31, 2024), the resource was assessed to its cleared ICAP of 100MW and delivered 70MW during a capacity test, which is below the 10% HDR performance threshold (new thresholds for HDR are discussed in Improvement #2: Revised Performance Assessment Thresholds, under section Enhancements #2: Performance Assessment Modifications). The PAF_{summer} would be calculated as:

$$PAF_{\text{summer}} = 1 - (70\text{MW} / 100\text{MW}) = 1 - 0.7 = 0.3 \text{ (30\%)}$$

During the winter obligation period of the December 2022 auction, (November 1, 2023 to April 30, 2024), the resource was assessed to its cleared ICAP of 100 MW and delivered 91 MW during a capacity test. The resource delivered capacity within the new HDR performance threshold of 10%. Therefore,

$$PAF_{\text{winter}} = 0$$

Its UCAP values would be calculated as follows:

$$\begin{aligned} UCAP_{\text{Summer}} &= ICAP \times (1 - PAF_{\text{Summer}}) \\ &= 100\text{MW} \times (1 - 0.3) \\ &= 100\text{MW} \times 0.7 \\ &= 70\text{MW} \end{aligned}$$

And,

$$\begin{aligned} UCAP_{\text{Winter}} &= ICAP \times (1 - PAF_{\text{Winter}}) \\ &= 100\text{MW} \times (1 - 0) \\ &= 100\text{MW} \times 1 \\ &= 100\text{MW} \end{aligned}$$

Therefore, the resource would be qualified to offer 70 MW into the summer obligation period and 100 MW into the winter obligation period of the Capacity Auction.

Enhancement #2: Performance Assessment Modifications

The performance obligation and assessment framework is a critical aspect in properly incenting and verifying performance of resources that have been secured and paid for in the auction to meet resource adequacy. In order to enhance the reliability and market performance of acquired capacity resources, the IESO conducted a review of current performance obligation and assessment criteria to identify improvements. Improvements to the performance obligation and assessment framework identified through this review will be implemented for resources which secure an obligation in the December 2022 auction and will take effect at the beginning of the May 2023 Obligation Period.

The modifications to the performance obligation assessment framework described in the following subsections seek to achieve the objectives of:

- Incenting proper behaviour from acquired resources during the obligation period, including a resource's availability during hours of system need, and their bid and offer obligations in the energy market;
- Reducing the risk of underperformance, especially during hours of system need;
- Improving confidence in and addressing concerns related to the reliability value provided by resources secured in the auction; and
- Ensuring alignment, balance and fairness between capacity qualification and performance assessment for different resource types.

Below is a summary of the modifications to the performance assessment framework.

Table 2: Summary of Performance Assessment Framework Improvements

<p>Consistent Capacity Tests</p>	<ul style="list-style-type: none"> • Assess to Capability (ICAP): All resources will be assessed to their actual capability (or cleared ICAP) when tested • Revised Performance Thresholds: For HDR, reduce the performance threshold from 20% to 10% beginning with the December 2022 Auction; allow a 5% threshold for all other resources • Capacity Test Scheduling: All resources will be required to successfully schedule their resource to demonstrate its ICAP/cleared ICAP capability within an IESO-determined 5-day testing window.²
<p>Improve Performance</p>	<ul style="list-style-type: none"> • Future De-Rates Based on Performance: If a resource fails a capacity test below the requisite performance threshold, in addition to settlement charges applied within the obligation period, their UCAP value in the subsequent auction will be de-rated through the PAF starting with assessed performance in the Summer 2023 and Winter 2023/24 Obligation periods • Higher Charges at Times of Need: Augmented availability charge assessments (10x) for all resources in a circumstance where the IESO has issued an advisory notice for the declaration or potential declaration of an Emergency Operating State, or the issuance of an Energy Emergency Alert (EEA-1,2, or 3). The augmented availability charge assessment will remain in place until the expiration stated on the advisory notice. The augmented availability charge assessment will also apply when an HDR resource has been put on standby and the charge will continue to be in place until the end of the availability window for that day. The application of this charge will apply to HDR resources in lieu of an availability de-rate during qualification. (Note: The settlement of the 10x availability charge will include the applicable, currently existing, availability charge (for more details refer to M.M 5.5). The combined charges will amount to a total non-performance factor of 10). • Dispatch Testing: IESO will continue to have the discretion to test resources by scheduling them in the energy market to verify their ability to comply with dispatch based on submitted bids and offers. All existing charges and compliance referrals still apply. Capacity charges no longer apply to dispatch testing.

² Imports are subject to different testing procedures

<p style="text-align: center;">Fair Assessments</p>	<ul style="list-style-type: none">• Availability Charge True-Up: Allow resources to receive a credit for hours when availability over the duration of the obligation period exceeded their UCAP value. This assessment will true-up a Capacity Auction Resource’s hourly availability charges incurred over the Obligation Period, based on its performance across the season. The availability of the resource for each hour is capped at the minimum of either 15% above the resource’s capacity obligation, the resource’s cleared ICAP or the resource’s registered capability (applicable only to virtual HDRs). Refer to Market Manual 5.5 for more details.• The true-up payment is capped to the total availability charges incurred; i.e., no extra payment for over availability
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The following subsections will provide more detail on each enhancement.

Consistent Capacity Tests

Starting with resources that clear the December 2022 Capacity Auction, the following performance obligation and assessment criteria will be applied to capacity testing.

Improvement #1: Testing to ICAP for all Resources

Under the current framework, some resources are assessed on their ability to deliver to their full capacity obligation when tested, whereas others are only assessed against their submitted bids. This creates misalignment in how the IESO assesses whether different resources can deliver their full capability.

Under the new framework, all participating capacity resources will be assessed on their ability to deliver their ICAP value (or cleared ICAP value, if a resource clears only a portion of its capacity), within the performance assessment thresholds outlined below. This will help the IESO better assess whether a resource can deliver to their cleared ICAP capability in the energy market and will help to ensure a more level playing-field when assessing different resource types. Refer to [Appendix C](#) for information on how this new assessment criteria will result in changes to how settlement charges are assessed.

Improvement #2: Revised Performance Assessment Thresholds

Under the current framework, HDR resources are afforded a 20% threshold when capacity is assessed, whereas other resources have no allowance during the test. This creates an imbalance in how capacity performance is assessed across resource types.

Under the new framework, the IESO will reduce the capacity test performance assessment threshold for HDR resources from 20% to 10% and will introduce a 5% threshold for all other capacity resources. The different threshold for HDR is to account for the potential variance in the baseline process, which does not apply to directly metered resources. The new 5% threshold for all other capacity resources is meant to bring performance assessment thresholds in closer alignment across resource types.

Performance assessment thresholds will be considered in determining resource-specific PAFs during capacity qualification in future years. If a resource delivers a capacity amount within the thresholds indicated above during a capacity test, the resource will be deemed to have passed and no PAF will be applied in the applicable future UCAP calculation. If a resource delivers a capacity amount below the thresholds indicated above during a capacity test, the actual amount of capacity delivered will be used in the PAF calculation. These thresholds will also be considered when determining whether capacity charges apply (see [Appendix C](#)).

Applying the discussed revisions to thresholds contributes to a more uniform assessment across different resources while accounting for different characteristics in the participation models.

Improvement #3: Capacity Test Scheduling

Currently, the IESO is responsible for scheduling and dispatching resources as part of the capacity testing framework. Under the new framework, all capacity resources will be required to demonstrate their ability to get scheduled to their cleared ICAP within an IESO-determined Capacity Test window

once per obligation period.³ IESO will communicate when the 5-business day capacity test window will take place during the obligation period (details will be issued at least 10-business days in advance of the first day of the testing window). Resources must get scheduled by submitting bid/offer prices to ensure a dispatch schedule/activation notice is received (submit price taker bids/offers).

Hourly Demand Response (HDR) and Dispatchable Load Resources will be exempted from the Demand Response Bid Threshold for the testing window to allow them to submit bids to help ensure receipt of dispatch/activation.

The participant will be required to notify the IESO within 5-business days after the close of the test window of the day/hours for which the test occurred to allow the IESO to conduct performance assessments. Where participants fail to notify the IESO, the test will be considered a failure and a capacity charge will be applied.

As this will be an 'in-market' activation, resources will not be eligible for any out-of-market payments.

Generator-backed capacity imports are unique to other capacity resources in that they participate in the energy market under the import participation framework. Generator-backed capacity import resources will be required to conduct a self-scheduled capacity test within the first two months of each obligation period for which they have secured an obligation – this is discussed further in the Generator-Backed Imports section.

Improve Performance

The following two modifications have been designed to improve performance of acquired Capacity Auction Resources.

Improvement #4: Application of Future Capability De-rates

Under the current market design, if a resource fails the capacity test activation, there is no impact on that resource's qualified capacity in a future auction. This represents a risk to the IESO's reliability mandate. Starting with assessed performance in the Summer 2023 and Winter 2023/2024 obligation periods, the result of the capacity test performance assessment will impact a resource's qualified capacity value for future auctions through application of a PAF that will apply to future UCAP calculations. The PAF will reflect assessed performance occurring in the applicable obligation period outlined in [Appendix A](#). PAFs will always be calculated pursuant to the performance assessment pass/fail settlement criteria that were in place at the time that the capacity test occurred.

The application of past performance results provides a fair and proportional adjustment for future auctions based on a resource's demonstrated capability and a strong incentive for resources to meet performance criteria. It is also essential to give the IESO confidence that MWs secured from the resource in future years can accurately be relied on for resource adequacy.

Improvement #5: Incenting Performance at Times of System Need

³ Imports are subject to different testing procedures

Capacity Auction resources provide significant value to the IESO by delivering their capacity during times of system need to help maintain reliability. If the IESO is unable to rely on Capacity Auction resources during these times, additional measures may need to be taken to ensure reliability. The IESO continues to have concerns around the current performance of some resources against their capacity obligations and their obligations under the IESO Market Rules.

To incent availability performance, the IESO will be implementing an augmented availability charge with a non-performance factor (NPF) of 10. The 10x charge, which includes applicable availability charges, will apply during the following conditions:

- When an advisory notice has been issued for the declaration or potential declaration of an emergency operating state
- The issuance of an Energy Emergency Alert (EEA-1, 2, or 3)
- Where an HDR resource has been put on standby

The augmented availability charge will remain in place until the end of the availability window for which the standby is applicable or end of the system emergency advisory declaration.

Why augmented availability assessment for Standby?

Throughout the discussions and consultation with stakeholders on the proposed enhancements, the IESO has been guided by the principle that fairness is a critical aspect of design. However, the fairness principle need not (and in some cases should not) necessarily translate into rigid uniformity in the context of resources with fundamentally different characteristics. Instead, fairness should be considered holistically in the Auction and applied in a balanced way to account for the uniqueness of different resource types, their characteristics and their participation framework.

As highlighted earlier in this document, the IESO will be applying availability de-rates as an input to derive UCAP values starting with the 2022 Capacity Auction to better reflect their resource adequacy value. With the exception of HDR, all resources will have this availability assessment applied to them which will impact the maximum seasonal UCAP amount that they may offer into an obligation period of the Auction.

The HDR participation framework is unique from all other resource types because it involves the need for a standby notice to be triggered for this resource to continue to submit energy market bids for the hours of availability from pre-dispatch through to real-time. In contrast, there is no standby provision for dispatchable load or generation, which in effect, means these resources are on 'standby' 100% of the time. In addition to this, HDR resources are only obligated to submit measurement data to the IESO in the event of an activation. Due to these limitations, the IESO does not have sufficient historical real-time availability data with which to assess HDR during qualification.

Applying an availability de-rate to only a set of resources and not others creates a fundamental fairness concern, which has been identified by stakeholders during consultation. Applying an augmented availability charge when an HDR resource has received a standby notice is meant to account for the lack of an availability de-rate during qualification and aims to address these fairness concerns. This is a principled design feature intended to ensure a fair, balanced and equitable treatment when considered holistically and one which accounts for the unique characteristics and participation frameworks of different resource types.

Improvement #6: Dispatch Testing

Compliance with dispatch is a fundamental part of the efficient and reliable operation of the IESO-administered markets. All market participants are obligated under the market rules to submit, maintain and adjust energy bid and offer quantities that reflect actual capability from day-ahead through to real-time. Bids and offers directly influence market prices, unit commitments and inertia trade. In instances where energy bids or offers do not reflect actual capability and/or where resources fail to deliver against bids and offers within compliance deadbands, the reliability, efficiency and the overall integrity of the market can be negatively impacted.

In order to support market integrity, the IESO will continue to have the discretion to conduct up to two dispatch tests per obligation period with the purpose of verifying whether a resource is able to follow a dispatch instruction in compliance with submitted bids or offers. The IESO has the discretion to forgo dispatch testing if dispatch compliance can be verified through a previous in-market activation (including during capacity testing). The results of dispatch tests may be referred to the Market Assessment and Compliance division as appropriate. The IESO also has authority under Chapter 7 of the Market Rules to refuse the participation of a resource in a future capacity auction if their participation would negatively impact the reliable operation of the IESO-controlled grid.⁴

Market participants may receive out-of-market payments where dispatch tests have required the IESO to issue out-of-market activations or have constrained on a resource.

Fair Assessments

Improvement #7: Availability Charge True-Up

The transition from ICAP to UCAP requires the introduction of an availability assessment “true-up”. The true-up will compensate resources for some of the availability charges incurred if, on average the resource was available equal to or greater than their obligation amount over the period.

The Availability Charge True-up calculated for each hour will be capped at the minimum of either 15% above a resource’s UCAP obligation, the resource’s cleared ICAP, or the resource’s registered capability (applicable only to virtual HDRs).

The true-up ensures fairness by aligning the average assessment in UCAP qualification with an average assessment for availability, and incents resources to continue to offer their capability (i.e. their ICAP) to the market.

Availability Charge True-Up Example

Resource X has an ICAP of 10 MWs and a UCAP rating of 9 MW. Resource X clears the Auction, and has a Capacity Obligation of 9 MW. If during any hour of the obligation period, the resource is not available (due to an outage or de-rate) it will incur availability charges.

The Availability Charge True-up ensures that the availability charges incurred during outages or de-rates can be offset against those hours where the resource was available up to their cleared ICAP (the 10MWs in this example). The True-up payment/credit calculation will assess the availability of a resource throughout the entire obligation period considering the following:

⁴ <https://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-rules/mr-chapter7.ashx>

- The availability of the resource for each hour is capped at the minimum of either 15% above a resource's capacity obligation, the resource's cleared ICAP, or the resource's registered capability (applicable only to virtual HDRs)
- The true-up payment is capped to the total availability charges incurred; i.e., no extra payment for over availability.
- The Augmented Availability Charge Assessment is not included in the true-up calculation.

Enhancement #3: Expand Participation to Generator-Backed Capacity Imports

As indicated in the 2021 Annual Acquisition Report, the Capacity Auction will serve as a flexible mechanism to meet short-term Resource Adequacy needs over the next several years with targets that will be growing in future years. A major objective of the Capacity Auction enhancements described in this document is to increase competition by expanding participation in the auction and, by doing so, ensuring the auction can deliver competitive and cost-effective results.

The IESO schedules hourly transactions (imports and exports) over interties across a number of interconnections with other provinces and states. Energy trade is an important feature of the IESO market which contributes to more efficient regional asset utilization, competition and reliability. Starting with the 2020 Capacity Auction, the IESO enabled participation of imports to compete with internal resources to provide capacity. Currently, system-backed imports are permitted to participate in the Capacity Auction. In the case of a system-backed import, the capacity is backed by the system operator's supply rather than a specific generation resource. System-backed imports are more applicable in jurisdictions where vertically-integrated utilities (such as Hydro Quebec) own generation and transmission assets in addition to being the system operator and are thus willing to take on capacity positions in other markets. Throughout 2021, the IESO engaged with stakeholders to enable 'generator-backed' capacity imports from neighbouring jurisdictions to participate, beginning with the 2022 Capacity Auction. Generator-backed capacity imports are imports that are tied to or 'backed' by the capacity of a specific external merchant generation resource(s) within a neighbouring jurisdiction.

Over the course of 2021, the IESO has held discussions with Hydro Quebec, New York Independent System Operator (NYISO) and Midcontinent Independent System Operator (MISO) regarding the participation of generator-backed capacity imports in the IESO's Capacity Auction. The IESO expects to have the necessary measures in place to facilitate capacity imports from New York and Quebec for the 2022 Auction; capacity imports with other jurisdictions may be enabled in future years. The details of the requirements for generator-backed capacity imports are discussed below.

Eligibility

To participate in the IESO's Capacity Auction as a generator-backed capacity import, the owner of the participating resource(s) must meet the following eligibility requirements:

- Participate with an existing in-service generation facility that has been in operation for at least one year prior to the auction and located in a neighbouring jurisdiction whose Balancing Authority⁵ is willing to facilitate generator-backed exports out of their jurisdiction into Ontario
- Be able to transmit energy from the generation resource(s) to the Ontario border,

⁵ A balancing authority is defined by NERC as "the responsible entity that integrates resource plans ahead of time, maintains Demand and resource balance within a Balancing Authority Area, and supports Interconnection frequency in real time."

- Have generation resource(s) with a fuel type that is currently enabled to participate in the IESO’s Capacity Auction (i.e., dispatchable/controllable, not coal),
- Attest that no portion of the same capacity that is being offered into the IESO Capacity Auction is already committed to any other jurisdiction for the duration of the relevant obligation period.
- Be able to demonstrate that the generation resource(s) have received an accredited UCAP rating from an external jurisdiction/balancing authority for any resource which it plans to offer into the auction. In addition, a corresponding ICAP rating will need to be provided for capacity verification/testing purposes.

Pre-Auction Requirements

Organizations wishing to participate in the Capacity Auction as generator-backed capacity import resources located within a neighbouring jurisdiction, like all other participating organizations, will be required to be authorized as a Capacity Auction Participant (CAP) in order to qualify resources in a Capacity Auction. The owner of the generator backing the import will also be required to:

- Demonstrate deliverability of the submitted ICAP amount to the IESO:
 - This will need to be demonstrated by providing proof of ownership of firm transmission service to the Ontario border, proof of ownership of a direct transmission line to the Ontario border, or a neighbouring jurisdiction process that confirms deliverability to the border through a power flow assessment. The table below outlines the evidence that can be provided to the IESO to demonstrate the deliverability of energy from the resource to Ontario.

Table 3: Summary of Demonstration of Deliverability by Jurisdiction

Jurisdiction	Demonstration of Deliverability
NYISO	Proof that the resource(s) holds Capacity Resource Interconnection Service status
Hydro Quebec	Confirmation of firm transmission service from the transmission operator

- Complete an attestation that confirms the entirety of the offered capacity associated with the participating resource(s) are not under obligation to deliver capacity to the host system or any other entity for the duration of a given obligation period. If the participating resource(s) secures an obligation in the auction, the IESO may take further steps based on auction results to confirm that the same capacity is not committed to other jurisdictions for a period that overlaps with obligation(s) the resource(s) may have secured through IESO’s Capacity Auction.

- If a resource is found to have over-committed their offered MWs through this confirmation process, a capacity deficiency charge of 1.5 times the availability payment for the obligation period multiplied by the number of MWs over-committed will be applied.
- In addition, the MWs that are over-committed would not be included in IESO's resource adequacy assessments for the obligation periods for which they were committed and the owner of the participating resource(s) will be required to forfeit the MWs in their obligation that are over-committed, and the full Capacity Auction deposit if applicable.
- Complete the IESO's capacity qualification process. See the Capacity Qualification section of this document for details on how capacity from generator-backed capacity imports will be qualified for the auction.

Forward Period Requirements and Obligations

Capacity Auction Participants who receive a Capacity Obligation for a generator-backed capacity import resource(s) will be subject to the same forward period obligations as a resource that is already registered in the IESO-Administered Market (IAM), including registering as a Capacity Market Participant (CMP). The organization must also authorize as an Energy Trader – Importer in the IAM in order to submit import offers at the requisite intertie. Prospective market participants that may choose to participate as a generator-backed capacity import resource are recommended to consult Market Manual 5.4 – Prudential Requirements, for the prudential requirements for energy traders.

Obligation Period Requirements and Obligations – Performance Assessment

In addition to requirements that all CMPs who have secured a capacity obligation are required to complete in the obligation period, the owner of the resource(s) that will be participating as a generator-backed capacity import will be subject to the requirements described below.

Capacity Test Performance Assessment/ Confirmation of Resource Capability

The generator-backed capacity import resource(s) will be required to provide confirmation of the resource's cleared ICAP⁶. This confirmation process is described below:

⁶ For resources that partially clear the auction, this refers to the equivalent ICAP in proportion to the cleared UCAP.

A data submission must be provided to the IESO confirming the capability of the resource to generate to at least 95% of the cleared ICAP amount for a duration of up to four hours within the availability window, on a date that falls within the first two months of the committed obligation period(s). For generator-backed capacity imports that consist of multiple generation units, data submissions must be provided for each applicable generation unit. If the IESO deems, based on the data provided, that the resource successfully delivered its cleared ICAP, the test will be assessed as a pass. Failures will have a capacity charge levied and a PAF applied for future auctions.

In addition, the resource must successfully schedule an import into the IESO market for at least one hour that coincides with the duration of the above ICAP demonstration to its cleared ICAP amount.

Data Submission Requirements

All data submissions required for participation as a generator-backed capacity import in the IAM must be revenue-grade quality meter data and be accompanied by proof that the meter has been registered with and meets the market participation requirements of the host system operator. For generator-backed capacity imports that consist of multiple generation units, data submissions must be provided for each applicable generation unit. Data submissions required for capacity test performance assessments must be provided to the IESO on/by the sixth (6th) business day before the end of the month following the month in which the monthly data relates and be verified as accurate by the host system operator. For example, if the resource(s) performed its capacity test during the month of May, then the measurement data for the dates and hours required as outlined in the relevant sections above are due six (6) business days⁷ before the end of June. If the complete data set is not provided within the above timelines and/or is not verified as accurate by the host system operator, an administration charge may be applied.

Availability Performance Assessment

The generator-backed capacity import resource(s) will be subject to the same availability performance assessment and charges as similar resources located within Ontario and system-backed imports. The resource(s) will be assessed on whether it can submit and maintain import offers at the relevant interconnection point at or above the capacity obligation from day-ahead through pre-dispatch and into real-time for all hours within the availability window for each business day of the obligation period.

Capacity Call

A capacity call may be issued to the generator-backed capacity import resource(s) if the IESO is managing capacity shortage conditions in Ontario. The generator-backed capacity import resource(s) will need to successfully perform to any capacity calls in accordance with the general procedure outlined below. Failure to deliver on a capacity call will result in a Capacity Call Failure Charge being applied to the generator-backed capacity import resource(s).

⁷ Business days as recognized by the Province of Ontario.

A call may be issued to the generator-backed capacity import resource(s) by the IESO beginning in the day-ahead timeframe through to pre-dispatch but will account for mandatory window requirements and start up times. The call will indicate the amount (MW) and hours that the generator-backed capacity import resource(s) will need to inject and successfully schedule into Ontario.

Special e-tag procedures will be used to identify the transaction.

In response to the call, the resource(s) will need to successfully schedule an intertie transaction to the sink jurisdiction (Ontario) with the specified quantities and for the specified hours.

Refer to [Appendix C](#) a summary of Changes to Charges.

Outage Submission Requirements

The generator-backed capacity import resource(s) will be required to submit and seek approval from the IESO for any planned or forced outages in accordance with the process described in Market Manuals 12 and 7.3.

Operating Agreements

Operating agreements between the IESO and its neighbouring jurisdictions will outline the internal provisions required to be in place to facilitate the trade of capacity between the participating jurisdictions. These provisions may include:

- Procedures to confirm resources with a capacity obligation with the IESO will not be recalled during host-system capacity shortage conditions or relied upon to satisfy resource adequacy in the host jurisdiction;
- Procedures to outline the actions that must be taken by both the source jurisdiction and the IESO to facilitate the capacity call from the day-ahead time-frame through to real-time;
- Procedures to outline the post-auction process to confirm with neighbouring jurisdictions that a resource has not committed the same capacity to other jurisdictions for a period that overlaps with obligations the resource may have secured through the IESO's Capacity Auction;
- Procedures to outline a process to confirm deliverability of resources to the Ontario border, if necessary;
- Procedures to enable the transfer of data to confirm the capability of a resource to generate the ICAP amount as cleared in the IESO's Capacity Auction; and
- Procedures to outline how outage requests and de-rates are to be coordinated between the IESO and the host jurisdiction.

Conclusion

This document has outlined the design enhancements that will be implemented in the December 2022 Capacity Auction. These changes involve introducing a capacity qualification process, improving the performance assessment framework and increasing participation to generator-backed capacity imports. The changes will contribute to the IESO's objectives of improving performance and expanding participation, in order to increase the cost effectiveness and efficiency of the Capacity Auction.

The IESO intends to continue to make regular, incremental improvements to the Capacity Auction to increase competition and performance. Therefore, the Capacity Auction will evolve at a measured pace, allowing the IESO to refine auctions features when appropriate – responding to changes in system need and stakeholder feedback. Any future enhancements will be proposed to stakeholders in a transparent manner.

Appendix A – Summary of qualification details by Auction year

Auction Year	December 2022	December 2023	December 2024
Qualification Inputs	<ul style="list-style-type: none"> ▪ ICAP for all resources ▪ Historical data as required 	<ul style="list-style-type: none"> ▪ ICAP for all resources ▪ Historical data as required 	<ul style="list-style-type: none"> ▪ ICAP for all resources ▪ PAF for all resources ▪ Historical data as required
Inputs for Summer PAF Calculation	N/A	N/A	<p>All resources: Resource specific capacity test activation data from summer of auction year 2022 (Summer obligation period of May – October 2023)</p>
Inputs for Winter PAF Calculation	N/A	N/A	<p>All resources: Resource specific capacity test activation data from winter of auction year 2022 (Winter obligation period of November 2023 to April 2024)</p>
Qualification Outputs	UCAP for all resources	UCAP for all resources	UCAP for all resources
Auction Outputs	<ul style="list-style-type: none"> ▪ Cleared UCAP – used to assess availability performance ▪ Cleared ICAP – used for capacity test 	<ul style="list-style-type: none"> ▪ Cleared UCAP – used to assess availability performance ▪ Cleared ICAP – used to for capacity test 	<ul style="list-style-type: none"> ▪ Cleared UCAP – used to assess availability performance ▪ Cleared ICAP –used for capacity test
Testing Criteria	<ul style="list-style-type: none"> ▪ Cleared ICAP for all resources <ul style="list-style-type: none"> ▪ 10% threshold for HDR ▪ 5% threshold for all other resources 	<ul style="list-style-type: none"> ▪ Cleared ICAP for all resources <ul style="list-style-type: none"> ▪ 10% threshold for HDR ▪ 5% threshold for all other resources 	<ul style="list-style-type: none"> ▪ Cleared ICAP for all resources <ul style="list-style-type: none"> ▪ 10% threshold for HDR ▪ 5% threshold for all other resources
Performance Outputs	Summer & Winter PAF - to be calculated for all resources and used for qualification in December 2024 Auction	Summer & Winter PAF - to be calculated for all resources and used for qualification in December 2025 Auction	Summer & Winter PAF - to be calculated for all resources and used for qualification in December 2026 Auction

Appendix B – Determining PAF for HDR without applicable data: Weighted class average calculation

Weighted Class Average

To determine the weighted class average PAF for new HDR resources or HDR resources without historical data, IESO will use the Capacity Test Activation results from the most recent obligation period for which data is available. The following steps will be used to determine the weighted class average PAF:

1. Determine the number of resources that had participated in the obligation period of the season for which the average is being calculated
2. The hours for which each resource was activated/dispatched during the capacity test activation will be used
3. An average of the MW quantity delivered by a resource for each of the capacity test activation hours will be compared against the Cleared ICAP value. This will determine a resource-specific PAF for the capacity test activation based on how much capacity was delivered compared to the ICAP value, including whether or not each resource delivered its capacity within the 10% performance assessment threshold for HDR resources
4. If a resource fails to deliver within the 10% threshold, the resource-specific PAF for each activation will be equal to the percentage amount by which it failed to deliver its full cleared ICAP. For example, if a resource delivered 87% of its cleared ICAP, its PAF will be 13% or 0.87
5. To determine the weight of a resource relative to all other participating resources, the resource's cleared ICAP value will be divided by the highest cleared ICAP value among all participating resources within that obligation period
6. The weighted PAF for each resource for that activation data set will be determined by multiplying the weight of the resource with its calculated PAF.
7. Finally, a simple average is taken of weighted PAFs for all resources that were tested during the activation window to determine a weighted class average that can be applied to new HDR resources for their UCAP calculation.

Note: To determine the class average, IESO will consider the result of all participating resources from each Capacity Test activation in the obligation period irrespective of whether they under or over delivered compared to their cleared ICAP value during a particular activation. This is done to determine a true weighted average of the entire fleet

Appendix C: Summary of Changes to Charges

Settlement Charge	Description of Changes to Current Charges and How They Will Be Applied
Augmented Availability Charge	<ul style="list-style-type: none"> A new, augmented availability charge assessment, that combined with existing availability charges, will have an NPF of 10 (10x) will apply when the IESO has issued an advisory notice for the potential declaration of an emergency operating state, including a NERC Energy Emergency Alert. The augmented availability charge assessment will also apply where an HDR resource has been placed on standby.
Availability Charge	<ul style="list-style-type: none"> A true-up will be introduced that compensates for availability charges if, the availability of the resource is determined to be greater than or equal to its obligation amount. The true-up is capped to the total availability charges incurred over the obligation period. The availability of a resource for each hour is capped at the minimum of either 15% above a resource's capacity obligation, the resource's cleared ICAP or the resource's registered capability (applicable only to virtual HDRs). The true-up payment is capped to the total availability charges incurred; i.e., no extra payment for over availability. Also, the Augmented Availability Charge Assessment is not included in the true-up calculation.
Capacity Charge	<ul style="list-style-type: none"> Resources will be expected to provide their full capability (cleared ICAP) during capacity test performance assessments. Reduced thresholds (10% for HDR resources, 5% for all other resources) will be used in the evaluation of capacity test performance assessments within the new capacity testing framework The capacity charge for failed capacity tests will continue to be equal to one month's availability payment and will continue to be capped at no greater than one month's availability payment. Future PAFs will be derived

Settlement Charge	Description of Changes to Current Charges and How They Will Be Applied
	based on assessed performance starting in the Summer 2023 and Winter 2023/24 obligation periods.
Administration Charge and Dispatch Charge	<ul style="list-style-type: none"> • No change from today but Administration Charge will be extended to Generation Backed Capacity Imports when they fail to provide timely test and activation data. • No change to dispatch charge.
Capacity Deficiency Charge	<ul style="list-style-type: none"> • A new capacity deficiency charge will apply to generator-backed capacity import resources that have been deemed to have committed their cleared MWs to another jurisdiction for any period that overlaps with the IESO's Capacity Auction obligation periods. A capacity deficiency charge of 1.5 times the availability payment for the entire obligation period multiplied by the number of MWs over-committed will be applied.
Capacity Call Failure Charge	<ul style="list-style-type: none"> • A new capacity call failure charge will apply to generator-backed capacity import resources that fail to deliver their MW obligation amount in response to a capacity call. The capacity call failure charge will be equal to one month's availability payment.

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