

Capacity Auction Engagement Memo 1.0

Engagement Topic: Capacity Qualification – Non-HDR

Engagement Status: Complete

Date: August 2022

Existing Design

Participants enroll capacity into an auction during the pre-auction period. Enrolled capacity is defined as the amount of capacity a participant is willing to provide from a specific resource and usually represents a resource’s installed capacity (ICAP). A resource’s ICAP is not necessarily reflective of its contribution to resource adequacy needs, which is typically defined by the amount of capacity it can be expected to provide, on average, during a pre-defined window of peak hours in the obligation period.

Post-Implementation Design

A capacity qualification process will be used in the pre-auction period starting with the 2023 capacity auction to derive the Unforced Capacity (UCAP) value that a resource can offer into the capacity auction.

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.

A resource-specific UCAP value will be determined during the capacity qualification process for each seasonal obligation period. The Capacity Auction Participant can then choose to offer up to the resource's maximum summer and winter UCAP value into the Capacity Auction.

Submission of a Capacity Qualification Request

Authorized capacity auction participants who wish to participate in a given capacity auction must complete the capacity qualification process for **each** potential capacity auction resource.

Authorized capacity auction participants wishing to participate in an upcoming capacity auction will be required to submit the following information to the IESO:

1. The ICAP for each potential capacity auction resource,
 - For capacity auction eligible storage resources:
 - The temperature-sensitive maximum power rating of the resource that can be sustained for 1 hour (Full Power Operating Mode)
 - The temperature-adjusted maximum amount of energy in MWh (Energy Rating), that the resource is capable of delivering when it is fully charged

The Full Power Operating Mode and Energy Rating will be used to determine the ICAP of a capacity storage resource using the following formula:

$$\text{ICAP} = \left[\frac{\min(\text{Full Power Operating Mode}, \text{Energy Rating})}{4 \text{ hours}} \right]$$

- For generator-backed capacity auction eligible import resources, the ICAP must be provided for each generator-backed import contributor
2. The obligation period(s) for which they may wish to submit capacity auction offers. Participants may choose to submit capacity auction offers for one or both obligation periods,
 3. The type of capacity auction resource that will satisfy a capacity obligation during the commitment period
 4. For eligible capacity auction resources located in Ontario:
 - the registered facility and associated resource that will satisfy the capacity obligation; or
 - the zonal location of demand response resources and for which they are willing to submit offers. Participants may choose from the ten electrical zones to submit capacity auction offers.
 5. For capacity import resources:
 - a) generator-backed and system-backed
 - the external interface that will be used to deliver the auction capacity
 - b) generator backed
 - Proof of deliverability to the Ontario border
 - Fuel type (must be a fuel type that is eligible to participate in Ontario)
 - Confirmation the resource is existing and in-service in the host jurisdiction
 - Confirmation that any capacity committed as part of a capacity obligation will not be also committed to another jurisdiction for any time during the obligation period

- c) system-backed
 - Confirmation that actions have been taken in order to ensure that capacity imports related to a capacity obligation will be offered into Ontario using 7F transmission service, and that the planning authorities responsible for adequacy assessments will remove any MWs related to a capacity obligation from its adequacy assessments

Capacity Qualification Assessment

Based on the information provided by the participant as part of the capacity qualification request, the IESO will determine the maximum amount of UCAP that each capacity auction resource can offer into the capacity auction for one or both of the summer and winter obligation periods using the assessment criteria detailed below.

UCAP Assessment for Generation Resource, Storage Resource, and Dispatchable Load Resource

The formula for determining the maximum UCAP for capacity auction eligible generation resources, capacity auction eligible storage resources, and capacity dispatchable load resources is as follows:

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

Where:

- Availability De-Rating Factor reflects a resource’s historical availability and is calculated for each capacity auction resource type as specified in table 1-2. The availability de-rating factors are based on one of two criteria, equivalent forced outage rate on demand (EFOR_d), or production data from the top 200 hours of Ontario demand (per season) which are further defined below.
- PAF is the Performance Adjustment Factor which reflects historical performance during a capacity auction capacity test activation in the relevant summer or winter obligation period from two auctions prior

Table 1-2: Availability De-Rating Factors by capacity auction resource type

Capacity Auction Resource Type	Availability De-Rating Factor
Capacity auction eligible generation resource (Dispatchable Thermal)	EFOR _d , based on 5 years of historical data. For <i>capacity generation resources</i> with less than 5 years of historical data, a proxy value will be used based on the median EFOR _d of Ontario’s thermal generation fleet ¹

¹ Median EFOR_d of Ontario’s natural gas fleet excluding Lennox Generating Station.

Capacity Auction Resource Type	Availability De-Rating Factor
Capacity auction eligible generation resource (Dispatchable Hydro)	<p>Median$\left[\frac{\text{AQEI(MWh)}+\text{Scheduled Operating Reserve(MWh)}}{\text{MAPC}}\right]$ in Top 200 hours of Ontario demand per season for the last 5 years</p> <p>Where:</p> <ul style="list-style-type: none"> • AQEI is the Allocated Quantity of Energy Injected, in MWh • Scheduled OR is the 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 <p>For <i>capacity auction eligible generation resources</i> that are dispatchable hydro with less than 5 years of historical data, the median value for the zone will be used. Where there is no dispatchable hydro generation in a zone, an Ontario-wide median will be used.</p>
Capacity auction eligible storage resource	EFOR _d of 5%
Capacity dispatchable load resource	<p>Median$\left(\frac{\text{hourly bids quantity}}{\text{maximum seasonal energy bid quantity}}\right)$ in top 200 hours of Ontario demand per season</p> <p>For new <i>capacity dispatchable load resources</i>, a fleet specific class median will be applied.</p>

UCAP Assessment for System-backed Capacity Auction Eligible Import Resource

The formula for determining the maximum UCAP for system-backed capacity auction eligible import resources is as follows:

UCAP = ICAP

UCAP Assessment for Generator-backed Capacity Auction Eligible Import Resource

For generator-backed capacity auction eligible import resources, the IESO will assess the UCAP for each generator-backed import contributor and provide a single UCAP that the capacity auction resource can offer into the auction. The single UCAP will be equal to the sum of each individual unit’s UCAP.

The formula for determining the maximum UCAP for a generator-backed import contributor that is a generation facility is as follows:

UCAP = Externally Accredited UCAP × (1 – PAF)

Where:

- External system UCAP accreditation is the accredited UCAP rating from an external jurisdiction provided by the capacity auction participant in the capacity qualification request submission
- PAF is the Performance Adjustment Factor which reflects historical performance during a capacity auction capacity test activation in the relevant summer or winter obligation period

from two auctions prior, starting with the obligation periods associated with the 2022 capacity auction.

The formula for determining the maximum UCAP for a generator-backed import contributor that is a storage facility is as follows:

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

Where:

- Availability De-Rating Factor is the EFOR_d , or the equivalent forced outage rate on demand, and is set at 5%
- PAF is the Performance Adjustment Factor which reflects historical performance during a capacity auction capacity test activation in the relevant summer or winter obligation period from two auctions prior, starting with the obligation periods associated with the 2022 capacity auction.

Any capacity auction resource assessed to have a UCAP below 1MW will be unable to participate in the capacity auction. For generator-backed capacity auction eligible import resources, any generator-backed import contributor that is assessed to have a UCAP below 1 MW will be unable to participate as part of the generator-backed capacity auction eligible import resource portfolio in the capacity auction.