



MANUAL

Market Manual 12.0: Capacity Auctions

Issue 13.0

This market manual is provided for stakeholder engagement purposes. Proposed changes, to be effective for the December 2022 capacity auction, are indicated based on the current version of the market manual. Please note that additional changes to this document may be incorporated as part of future engagement on design enhancements to the capacity auction or other IESO activities prior to this market manual taking effect.

This market manual provides guidance to market participants on the operation of the capacity auction process

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This *market manual* may contain a summary of a particular *market rule*. Where provided, the summary has been used because of the length of the *market rule* itself. The reader should be aware, however, that where a *market rule* is applicable, the obligation that needs to be met is as stated in the “Market Rules”. To the extent of any discrepancy or inconsistency between the provisions of a particular *market rule* and the summary, the provision of the *market rule* shall govern.

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Reference (Section and Paragraph)	Description of Change
Section 3.2	<p>Wording included to clarify that the Capacity Auction Participant (CAP) will become the Capacity Market Participant (CMP) to ensure participants are aware that ownership requirements for physical resources will apply to CAPs as well.</p> <p>Inclusion of “Electricity Storage Participant” to list of classes of participation for which a CAP may also authorize.</p>
Section 4.1	<p>Wording included to clarify that a CAP may revise a capacity auction offer in Online IESO up until the capacity auction offer window closes.</p>
Section 5.2	<p>Wording included to clarify that CAP, except in the case of imports, must be the registered owner of the resource as defined in Market Manual 1.5.</p> <p>Wording included to clarify that a CAP with a physical capacity obligation providing demand response (DR) must register the DR resource as hourly demand response (HDR) or dispatchable load.</p> <p>Wording included to clarify a CAP with virtual HDR resource may include physical non-dispatchable load as DR contributors.</p> <p>Wording amended to clarify timelines for registration activities.</p>
Section 5.3.3	<p>Remove dispatchable load testing instruction that applies to obligation period ending April 2021 (2019 DR Auction).</p>
Section 5.6	<p>Wording amended to reflect non-performance charges occur if measurement data submission was not deemed accurate, timely or complete (to align with Market Rules) and for failing to deliver capacity in the energy market in a test activation.</p>
Section 8	<p>Wording amended to clarify a capacity obligation transfer will be valid for all of the associated obligation period.</p> <p>Wording added to clarify that if a CAP or a CMP wants to submit multiple transfer partial requests from the same capability obligation, the IESO must approve the first request before the second request can be submitted to the IESO.</p>
Throughout	<p>Defined terms have replaced previously undefined terms (e.g., contributors vs demand response contributors).</p> <p>Defined terms are italicized.</p>

Market Manuals

The *market manuals* consolidate the market procedures and associated forms, standards, and policies that define certain elements relating to the operation of the *IESO-administered markets*. Market procedures provide more detailed descriptions of the requirements for various activities than is specified in the “Market Rules”. Where there is a discrepancy between the requirements in a document within a *market manual* and the “Market Rules”, the “Market Rules” shall prevail. Standards and policies appended to, or referenced in, these procedures provide a supporting framework.

– End of Section –

1. Introduction

1.1 Purpose

The IESO will conduct *capacity auctions* for the purpose of acquiring *auction capacity* through a competitive auction process (Ch. 7, S.18.1 of the *market rules*). The “Capacity Auctions” [market manual](#) is designed to provide *market participants* with an introduction to the *capacity auction*, operated by the IESO for the *IESO-administered markets* and the specific steps to be followed to conduct the auction. The [market](#) manual also provides information on *market participants’* eligibility criteria, auction timelines, *energy market* participation, and settlement process.

1.2 Scope

Capacity auctions, with respect to *IESO-administered markets*, are comprised of the following aspects:

- *Market participant* authorization [as a capacity auction participant](#),
- ~~Enrollment into an upcoming capacity auction by capacity auction participants,~~
- [Submission of a capacity qualification request by a capacity auction participant, determination of the amount of unforced capacity \(UCAP\) for each capacity auction resource by the IESO, and the submission of a capacity auction deposit by a capacity auction participant, ahead of an upcoming capacity auction,](#)
- Submission of *capacity auction offers* by ~~market~~[capacity auction](#) participants,
- Processing of submitted *capacity auction offers* by the IESO and determining *capacity obligations*,
- Reporting [of auction results and capacity obligations](#) by the IESO,
- *Energy market* participation requirements, ~~including registration of demand response resources solely for the purposes of the capacity auction~~
- Testing of *capacity auction resources*, and
- *Settlement process* and *capacity prudential support obligations*.

In support of these aspects, this [market manual](#) details the conditions, actions, and timelines specific to the *capacity auction* by *market participants* and the IESO. This [market manual](#) also details the *energy market* participation requirements, settlement process, and *capacity prudential support obligations* for the *capacity auctions* by *market participants* and the IESO. The [market manual](#) is based on obligations expressed in the “Market Rules” (Ch. 2, Ch. 3, Ch. 7, and Ch. 9).

~~The document~~ [This market manual](#) points to other *market manuals* and *market rules* that provide additional information.

1.3 Who Should Use This Manual

The “Capacity Auctions” *market manual* is meant to be used by all those undertaking the following activities:

- Applicants seeking authorization as a *capacity auction participant* and/or *capacity market participant* for a *capacity auction*;
- *Capacity auction participants* seeking to ~~enroll in a~~[enroll in a capacity auction](#) ~~into the~~[determine their UCAP ahead of a](#) *capacity auction*;
- *Capacity auction participants* seeking to submit *capacity auction offers* into the *capacity auction*;
- *Capacity market participants* seeking to register *facilities* in order to meet their *capacity obligations* through the *energy market*; and
- *Capacity market participants* seeking to satisfy a *capacity obligation* by participating in the *energy market*.

1.4 Contact Information

Changes to this *market manual* are managed via the IESO Change Management process, which can be found on the [Change Management Overview page \(http://www.ieso.ca/sector-participants/change-management/overview\)](http://www.ieso.ca/sector-participants/change-management/overview). Stakeholders are encouraged to participate in the evolution of this *market manual* via this process.

To contact the IESO, you can email IESO Customer Relations at customer.relations@ieso.ca or use telephone or mail. Telephone numbers and the mailing address can be found on the [Contact page \(http://www.ieso.ca/corporate-ieso/contact\)](http://www.ieso.ca/corporate-ieso/contact). IESO Customer Relations staff will respond as soon as possible.

1.5 Applicability

Pursuant to *market rules* Chapter 7, section 18.1A, a *market participant* that participates in a *capacity auction* will, until the end of that *capacity auction's commitment period*, remain subject to those *market manual* provisions and corresponding *market rules* that were most recently in effect at the time of the holding of that *capacity auction* (except as provided by section 18.1A.3 in regards to *urgent amendments*). ~~The versions of the~~ [and section 18.1A.1.1 in regards to amendments that expressly exclude the application of sections 18.1A.1 and 18.1A.2](#)). ~~The versions of the~~ *market manuals* in effect at the start of the *capacity auction* offer submission window specify the rights and obligations related to participation, satisfaction of *capacity obligations*, and performance of other requirements directly related to participation (notwithstanding any amendments that may have been made subsequent to the relevant *capacity auction* [except as provided by section 18.1A.3 in regards to urgent amendments and section 18.1A.1.1 in regards to amendments that expressly exclude the application of sections 18.1A.1 and 18.1A.2](#)).

Market participants consulting this *market manual* ~~12~~ must verify that they are consulting the version of the *market manual* corresponding to the *capacity auction* in which they participated or wish to participate.

An archive of *market manuals* corresponding to particular *capacity auctions*, organized by date, can be found on the [Market Rules and Manuals page \(http://www.ieso.ca/en/Sector-Participants/Market-Operations/Market-Rules-And-Manuals-Library\)](http://www.ieso.ca/en/Sector-Participants/Market-Operations/Market-Rules-And-Manuals-Library)Capacity Auction Rules Library (<https://www.ieso.ca/en/Sector-Participants/Change-Management/Capacity-Auction-Rules-Library>).

– End of Section –

2. Capacity Auction Overview

Capacity auctions acquire auction capacity for one commitment period, which consists of two obligation periods, referred to as summer and winter periods.

2.1 Capacity Auction Process

Figure 2-1 below shows a representative capacity auction process overview:

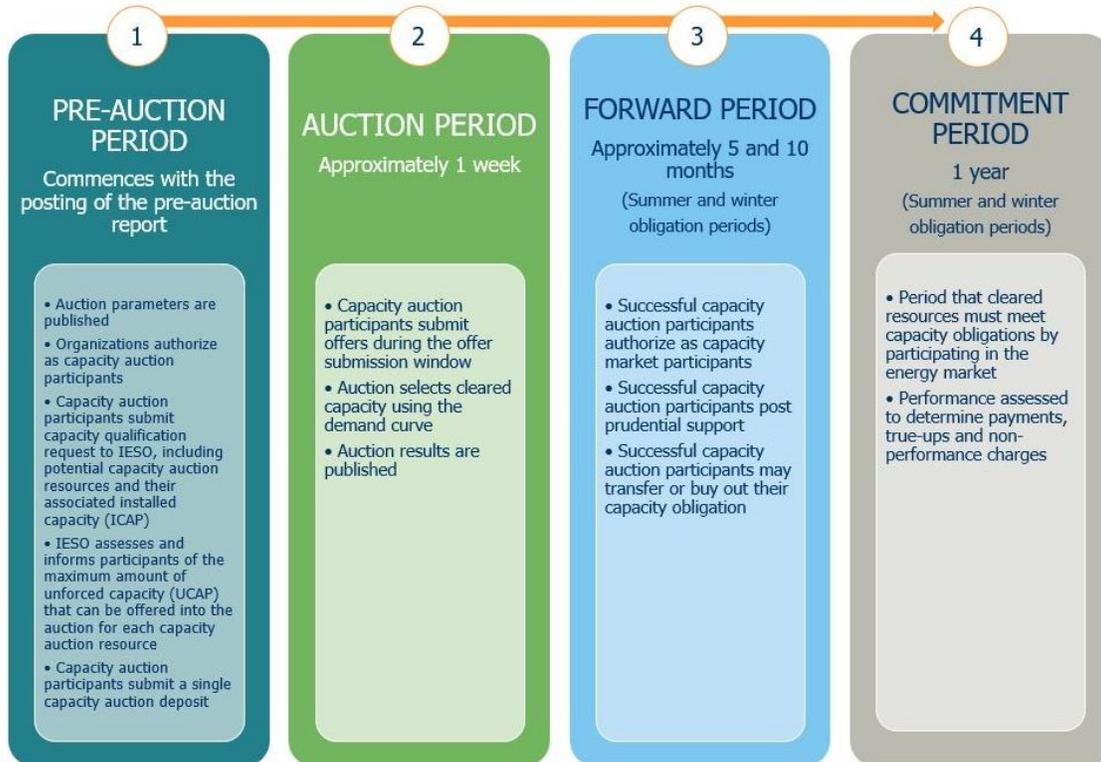


Figure 2-1: Capacity Auction Process

Market participants who wish to participate in the capacity auction are required to authorize as capacity auction participants and complete the capacity enrollment process in order to submit their capacity auction offers into the capacity auction. Upon validating all submitted offers, the IESO will process the offers, determine the clearing price for each electrical zone, determine the quantity of auction capacity cleared and prepare and publish the post auction reports. All capacity auction participants that successfully obtain at least one capacity obligation are required to authorize as capacity market participants, and provide capacity prudential support as determined by the IESO. Demand response resources may receive a capacity obligation prior to registering facilities. During the forward period, these demand response resources must register facilities in the IESO registration system as described in “Market Manual 1.5: Market Registration Procedures” and assign the associated demand response resource to the capacity obligation.

2.2 Capacity Auction Timelines

Ontario's *capacity auction* follows the following timelines:

- The IESO will *publish* a pre-auction report ~~no less than two months~~ prior to the start of the ~~offer submission window~~ capacity qualification process for the *capacity auction*.
- *Market participants* intending to participate in the *capacity auction* must complete their authorization as a capacity auction participant at least 40 business days participant in advance of ~~the~~ initiating a capacity auction, or within such other period as set by qualification request, and no later than five business days prior to the start of the IESO qualification assessment window as specified in its sole and absolute discretion[‡], the pre-auction report
- ~~Market participants intending to participate in~~ During the qualification request submission window, capacity auction participants are required to ~~complete~~ submit a capacity qualification request identifying each potential capacity auction resource, and its corresponding installed capacity (ICAP) that they wish to have qualified in order to offer into the capacity enrollment process and afterwards auction.
- The IESO will complete an assessment to determine the unforced capacity (UCAP) for each potential capacity auction resource, and will notify capacity auction participants of this amount at the end of the qualification assessment window as specified in the pre-auction report.
- Capacity auction participants are required to submit the *capacity auction deposit* amount at least five *business days* prior to the start of the *offer submission window* for the *capacity auction*.
- The *capacity auction* will accept offers from *capacity auction participants* on the date announced in the pre-auction report, starting at 09:00 EST and ending on the next *business day* at 23:59 EST. This period is referred to as the ~~auction offer~~ submission window. *Capacity auction participants* intending to participate in the *capacity auction* must have submitted their *capacity auction offers* to the IESO during the ~~auction offer~~ submission window.
- The IESO will process all submitted *capacity auction offers*, determine clearing prices and quantities, and prepare and publish both the public and confidential post-auction reports within by 16:00 EST, four business days, following the day on which the ~~auction~~ offer submission window closes.
- ~~The IESO will publish both public and confidential reports post auction.~~

The following figure illustrates the *capacity auction* timelines:

[‡]Should the IESO determine another period for *market participants* to complete authorization as a *capacity auction participant*, this period will be published in the "Auction Timelines" posted on the IESO Website.



Figure 2-2: Capacity Auction Timeline

2.3 Commitment Periods and Obligation Periods

The *commitment period* is the period of time for each *capacity auction* over which it secures *auction capacity*. It consists of two *obligation periods*, which are the periods of time for which a *capacity market participant* is required to satisfy its *capacity obligation* through the day-ahead commitment process and energy market.

There are two seasonal *obligation periods* for a *capacity auction*, defined as:

- Summer – May 1 to October 31
- Winter – November 1 to April 30

Forward period means the period of time ~~immediately following a capacity~~ beginning three business days after the auction period, to the commencement of an *obligation period*. The length of the *forward period* will vary depending on the date of a *capacity auction* relative to its *obligation period*.

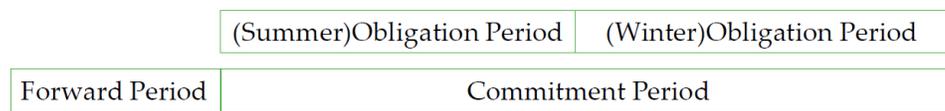


Figure 2-3: Periods of time related to *capacity auctions*

Capacity auction participants may choose to submit *capacity auction offers* into either one or both of the *obligation periods*. The auction for both *obligation periods* requires separate *capacity auction offers* for each of the *obligation periods*. The two *obligation periods* will be evaluated individually using the submitted *capacity auction offers* compared to pre-determined demand curves, and will therefore have their own *capacity auction clearing prices* and quantities. Participants will receive a set of separate *capacity obligations* for each period, where applicable, if they successfully clear the auction. *Capacity auction participants* who secure a position in a *capacity auction* are required to complete their authorization and registration requirements, as applicable, during the *forward period*, as explained in [Section 5](#) of this manual.

2.4 Availability Window

[\(Market Rules: Ch. 7, ss. 19.4.1, 19.5.1, 19.7.1, 19.9.1, 19.9A.1 and 19.11.1\)](#)

The summer *availability window* will consist of *business days* from 12:00 to 21:00 EST (hour ending 13 to hour ending 21) and the winter *availability window* will consist of *business days* from 16:00 to 21:00 EST (hour ending 17 to hour ending 21).

~~Capacity~~ All capacity market participants satisfying with a capacity obligation with demand response resources will receive an availability payment associated with their *capacity obligation(s)*.

Availability payments may be offset with non-performance charges in accordance with “Market Manual 5.5: Physical Markets Settlements Statements” during the associated *obligation period* ~~(Ch. 7, ss. 19.5.1 and 19.4.1 of the market rules).~~

~~Capacity market participants satisfying a capacity obligation with capacity generation resources, capacity storage resources and capacity import resources will receive an availability payment associated with their capacity obligation. Availability payments may be offset with non-performance charges in accordance with “Market Manual 5.5: Physical Markets Settlements Statements” during the associated obligation period (Ch. 7, ss. 19.7.1, 19.9.1, and 19.11.1 of the market rules).~~

2.5 Demand Curve Elements

(Market Rules: Ch. 7, s. 18.5.2)

A *capacity auction* demand curve is a representation of the IESO’s willingness to acquire *auction capacity*; it defines the prices that the IESO is willing to pay for varying levels of *auction capacity* along the curve. The shape of the demand curve impacts the quantity (MW; the X-axis) and price (\$/MW-day; the Y-axis) of *auction capacity* that will be acquired through an auction. The *capacity auction* uses a downward-sloping demand curve defined by the following parameters and illustrated in Figure 2-4 below:

- Target capacity
- [Reference Capacity auction reference price](#)
- Maximum and minimum auction clearing prices
- Capacity limits

Given the dynamic nature of the *energy market*, the IESO will review the demand curve parameters at least once every three years to ensure it is reflective of the current market conditions and system needs.

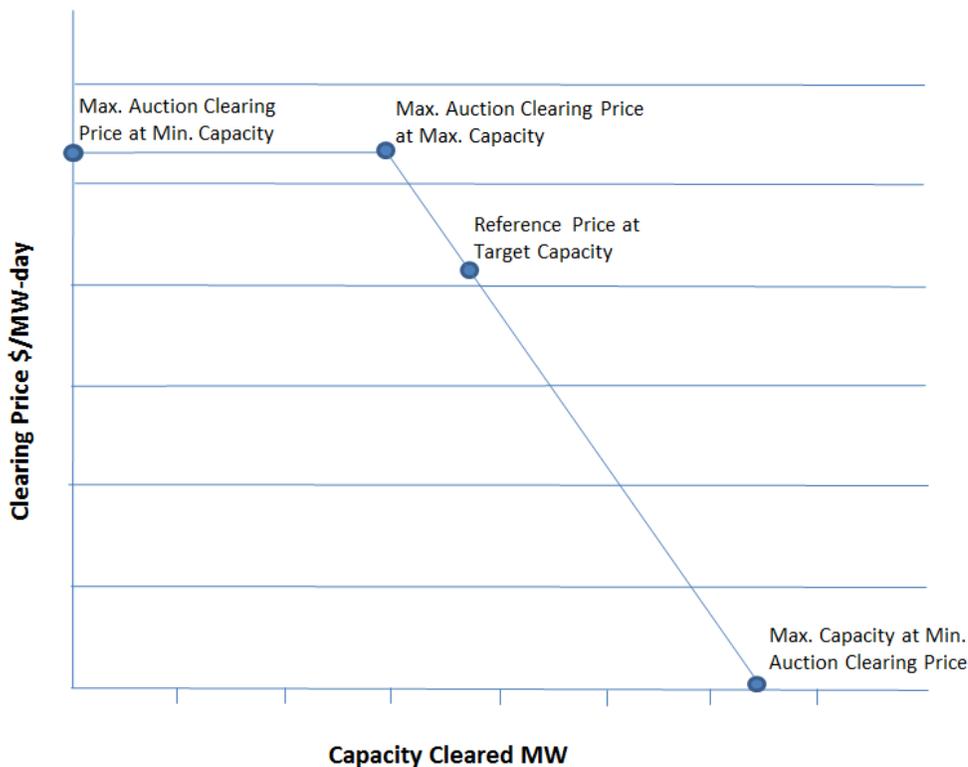


Figure 2-4: Downward Sloping Demand Curve

The key reference points on the downward-sloping curve shown above are further elaborated in the sections below.

2.5.1 Target Capacity

The *target capacity* for each *obligation period* will be determined based on the reliability need or any additional need identified by the IESO. The *target capacity* for each *obligation period* shall be published by the IESO in the pre-auction report ~~(Ch. 7, S. 18.5.2 of the market rules).~~

2.5.2 Reference Price

~~The *capacity auction reference price* represents the price at which resources are incented to enter the market and recover the necessary costs to make their capacity available, recognizing their revenue opportunities and avoided costs in the energy market. The reference price is directly associated with the *target capacity* as another key reference point in the demand curve. (Ch. 7, S. 18.5.2 of the market rules).~~

The *capacity auction reference price* for each *obligation period* shall be published by the IESO in the pre-auction report ~~(Ch. 7, S. 18.5.2 of the market rules).~~

2.5.3 Maximum and Minimum Auction Clearing Price

The maximum *capacity auction clearing price* is the maximum price that a *capacity market participant* may be paid for *auction capacity*. The maximum *capacity auction clearing price* is set at a multiple of 1.25 times the *capacity auction reference price*.

The minimum *capacity auction clearing price* is \$0/MW-day.

The maximum and minimum *capacity auction clearing price* for each *obligation period* shall be published by the IESO in the pre-auction reports.

2.5.4 Capacity Limits

The capacity limits used in the demand curve are:

- the minimum capacity,
- the maximum capacity at maximum *capacity auction clearing price*, and
- the maximum capacity

The minimum capacity is the minimum amount of *auction capacity* that the IESO will clear through a *capacity auction* for each *obligation period*.

The maximum capacity at maximum *capacity auction clearing price* will be determined based on the following formula:

$$\text{MaxCap}(\text{MACP}) = \frac{\text{RP} \times \text{TC}}{\text{MaxP}}$$

Where:

- MaxCap(MACP) is the maximum capacity at the maximum *auction clearing price*,
- RP is the *capacity auction reference price*,
- TC is the *target capacity*, and
- MaxP is the maximum *capacity auction clearing price*.

The maximum capacity is the maximum amount of *auction capacity* which the IESO will clear through the auction. The maximum capacity is determined by forming a straight line between the points defined by the maximum capacity at the maximum *capacity auction clearing price* and the *target capacity* at the *capacity auction reference price*, and extending this line to the price of

\$0/MW-day. The capacity limits for each *obligation period* shall be *published* by the IESO in the pre-auction report ~~(Ch. 7, S.18.5.2 of the market rules).~~

2.6 Zonal Constraints

The ten electrical zones of Ontario are used to acquire *auction capacity* for the *capacity auction*. The IESO establishes zonal requirements or limits that will be used to set any minimum and maximum capacity limits, respectively, that can be cleared in the *capacity auction* for each [electrical](#) zone.

Each [electrical](#) zone has a set of *capacity auction zonal constraints* defined. These include

- minimum amount of *auction capacity* to be acquired
- total maximum amount of *auction capacity* that can be acquired
- maximum amount of *auction capacity* from resources not revenue-metered by the IESO (i.e. virtual resources) that can be acquired. This limit will not set the zonal *capacity auction clearing price*.

[A set of capacity auction zonal constraints will also be defined for groups of electrical zones that are located behind a single limiting interface. These include:](#)

- [minimum amount of auction capacity to be acquired](#)
- [total maximum amount of auction capacity that can be acquired](#)

The *capacity auction* will establish an Ontario-wide *capacity auction clearing price* as well as possible zone specific *capacity auction clearing prices* [for individual or groups of electrical zones](#). The IESO shall *publish capacity auction zonal constraints* in the pre-auction reports.

2.7 Capacity Import Constraints

The external interfaces between the *IESO-controlled grid* and neighbouring systems may be used to acquire *auction capacity* for the *capacity auction*. The IESO will establish maximum capacity import [limits constraints](#) that can be cleared in the *capacity auction*. These [limits constraints](#) apply to [system-backed capacity import resources and generator-backed capacity import resources](#).

Capacity auction offers associated with eligible [system-backed capacity import resources and generator-backed capacity import resources](#) will clear the *capacity auction* subject to the following constraints:

- maximum amount of *auction capacity* that may be provided by all [system-backed capacity import resources and generator-backed capacity import resources](#). When this constraint is binding, [it will limit the amount of capacity import resources that clear, however,](#) it will not determine the *capacity auction clearing price*, and
- maximum amount of *auction capacity* that may be provided by all [system-backed capacity import resources or generator-backed capacity import resources](#) at each external interface. When this constraint is binding, [it will limit the amount of capacity import resources that clear at each external interface, however,](#) it will not determine the zonal [capacity auction clearing price or zone group capacity auction clearing price](#). External interfaces not listed in

the pre-auction report indicate that they border upon a jurisdiction where there is no associated agreement between the relevant balancing authorities².

~~Capacity~~ *System-backed capacity import resources and generator-backed capacity import resources* will be subject to the *capacity auction zonal constraints* in the external interface's bordering electrical zone, as described in ~~Section 2.6~~ *Section 2.6*. As such, there will be no price separation for *either system-backed capacity import resources and/or generator-backed capacity import resources, and the resources located* within ~~the Ontario's~~ *the Ontario's* electrical zone the interface borders. The *IESO* shall *publish* capacity import constraints in the pre-auction reports.

- End of Section -

3. Pre-Auction Requirements

In order to conduct the *capacity auction* in a consistent and transparent manner, the *IESO* and the *market participants* must satisfy certain pre-auction ~~obligations~~ *requirements*.

The *IESO* shall prepare a pre-auction report containing *capacity auction* related information, and *publish* it in advance of the auction, as explained in ~~Section 3.1~~ *Section 3.1* below. There are ~~pre-auction~~ *also participant* authorization, ~~enrollment~~ *capacity qualification*, and *capacity auction deposit* requirements for *market participants* who wish to participate in the *capacity auction*, as further explained in below.

3.1 Pre-Auction Reporting ~~Obligations~~ *Report*

(Market Rules: Ch. 7, S. ~~18.5.2, 18.5.4, 18.5.5, 18.5.6~~)

Prior to the *capacity auction*, the *IESO* shall *publish* a pre-auction report to include the following reference points, for both *obligation periods* ~~(Ch. 7, S. 18.5.2 of the market rules):~~

- *Target capacity*
- *Capacity auction reference price*
- Minimum and maximum *capacity auction clearing prices*
- Minimum and maximum *auction capacity* to be secured
- Maximum *auction capacity* to be secured at the maximum *capacity auction clearing price*
- Zonal ~~limitations~~ *constraints* for each electrical zone, ~~and groups of zones~~ as explained in ~~Section 2.6~~ *Section 2.6* of this manual
- Capacity import constraints as explained in Section 2.7 of this manual

In addition to these reporting ~~obligations~~ *requirements*, the *IESO* will also *publish*:

² Agreements between the relevant balancing authorities will, at a minimum set out requirements for firm transactions and confirmation that capacity transacted as a result of a capacity auction will be coordinated between the balancing authorities (e.g. removed from applicable adequacy assessments).

- the ~~timelines~~dates for *capacity auction participants* to ~~enroll~~potential~~submit a capacity qualification request~~
- the date that the IESO will notify *capacity auction resources and the amount*participants of ~~the auction~~the unforced *capacity that they are willing to provide for each*(UCAP) of their potential *capacity auction resource* ;
- the date by which *capacity auction participants* must post a capacity auction deposit;
- the dates that the IESO will conduct the *capacity auctions* as well as the date by which the IESO will *publish* the public and confidential post-auction reports (Ch. 7, S. 18.5.4 of the *market rules*); and
- a link to a mapping tool to assist with the determination of which zone *capacity auction resources* are located, based on their physical address.

3.2 ~~Pre-Auction~~Participant Authorization Process

(Market Rules: Chapter 2, section 2.1.1.1.11 and 2.1.1.1.12, Chapter 7, section 18.2.1.1, 19.8 and 19.9A)

All prospective participants who wish to submit a capacity qualification request to participate in the *capacity auction* are required to authorize as *capacity auction participants* (Ch. 2, S. 2.1.1.1.11 and 2.1.1.1.12 of the market rules) through the IESO's market registration process. The *capacity auction participant* shall authorize as a *capacity market participant* during the *forward period* if a *capacity obligation* is awarded, per Section 5.1. Market authorization processes are further detailed in "Market Manual 1.5: Market Registration Procedures".

In addition to authorization as a *capacity auction participant*, *market participants* may be authorized as one of the following classes described in Market Manual 1.5, as applicable:

- *Generator*
- *Load*
- *Energy Trader*
- *Electricity Storage Participant*

3.3 ~~Capacity~~EnrollmentQualification

~~Capacity~~(Market Rules: Chapter 7, section 18.2 and 18.2A)

Authorized *capacity auction participants* who wish to participate in a given *capacity auction* ~~shall identify to~~must complete the ~~IESO the eligible~~capacity qualification process for each potential *capacity auction resource(s)* ~~with which they would intend to provide auction capacity for the duration of the relevant obligation period, as well as the maximum quantity of auction capacity that they might wish to provide from each individual eligible.~~ This process includes:

- the submission of a *capacity auction resource*. ~~This submitted quantity shall be used to set~~qualification request including any additional data that's required based on the *capacity auction participant's enrolled*resource type as outlined in section 3.3.1 of this manual, and
- The IESO assessment and determination of the potential *capacity* ~~for that auction.~~ The enrolled resources' unforced *capacity* ~~represents the maximum auction capacity that can be offered by the capacity auction resource in a given capacity auction for either obligation period. The IESO will communicate the submission deadline via the pre-auction report~~(UCAP) using the formulas outlined in this section .

Each potential *capacity auction resource* will represent a single resource according to the registration procedures described in “Market Manual 1.5: Market Registration Procedures”.

Authorized *A capacity auction participant may revise a capacity qualification request up until the capacity qualification submission window closes, and may withdraw a capacity qualification request up until the capacity qualification assessment window closes, per the timelines detailed in the pre-auction report. Both actions are completed in Online IESO.*

Submission of a Capacity Qualification Request

(Market Rules: Chapter 7, section 18.2.1.2)

Prior to the deadline specified in the pre-auction report, authorized *capacity auction participants wishing to participate in an upcoming capacity auction* are required to submit to the IESO, via Online IESO³, the following information in order to complete the ~~as part of a~~ capacity enrollment process ~~qualification request~~:

- The amount of ICAP for each potential ~~auction capacity, not less than 1 MW per capacity auction resource,~~
 - For generator-backed capacity auction eligible import resources, the ICAP must be provided for each generator-backed import contributor
 - For capacity auction eligible storage resources and generator-backed import contributors ~~that they could reliably provide, and may be willing to offer, in each obligation period, are storage facilities, the ICAP will be determined using additional information provided by the capacity auction participant as outlined in Table 1-1~~
- 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*,
- The type of *capacity auction resource* ~~(i.e. capacity import resource, capacity generation resource, hourly demand response (HDR) resource, capacity dispatchable load resource, capacity storage resource)~~ that will satisfy a *capacity obligation* during the *commitment period* and for *HDR resources*, the obligation type (e.g. physical or virtual) and contributor type (e.g. Residential or Commercial & Industrial). Refer to ~~Section 5.3.2~~ Section 5.3.2 for details on submitting *demand response contributor* data information.
- ~~If the resource type is a capacity generation resource or capacity storage resource, a signed attestation declaring that the generator that will deliver auction capacity meets the requirements of a capacity auction eligible generation resource or capacity auction eligible storage resource, respectively, as set out in Chapter 11, Definitions.~~
- 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/or *demand response contributors* for which they are willing to submit offers. Participants may choose from the ten electrical zones to submit *capacity auction offers*. The IESO shall

³ Online IESO is an online tool for *market participants* to submit data to the IESO; accessible at [Online IESO \(https://online.ieso.ca\)](https://online.ieso.ca).

publish zonal constraints in the pre-auction reports, as explained in [Section 3.1](#) of this manual.

For

- [Additional information is required for each capacity import resources:](#)
 - [the external interface that will be used to deliver the auction capacity; and](#)
- a signed attestation acknowledging that all eligibility requirements have been met [resource type](#), as set out [specified](#) in Chapter 11 of the [market rules](#) and that has taken such actions as are necessary in order to ensure that: [Table 1-1](#).
- [capacity imports related to Table 1-1: Additional information required for submission of a capacity obligation will be offered into Ontario’s energy market with firm 7F transmission service; and](#)
 - [the planning authority\(ies\) responsible for adequacy assessment\(s\) will remove any MW related to a capacity obligation associated with from its adequacy assessments](#)

Confirmation of having submitted the [qualification request by capacity auction deposit](#) as determined by the IESO, further explained in [Section 3.4](#) of this manual [resource type](#).

Capacity Auction Resource Type	Additional Information Required
Capacity generation resources	<ul style="list-style-type: none"> • The registered facility and associated resource that will satisfy the capacity obligation • A signed attestation declaring that the generator that will satisfy the capacity obligation meets the requirements of a capacity auction eligible generation resource as set out in Chapter 11, Definitions of the market rules. This attestation can be found in Appendix E: Attestation for Capacity Auction Eligible Generation Resource.
Capacity storage resources	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • The Full Power Operating Mode and Energy Rating will be used to determine the ICAP of a capacity storage resource using the following formula: $ICAP = \left[\min \left(\text{Full Power Operating Mode}, \frac{\text{Energy Rating}}{4 \text{ hours}} \right) \right]$ • The registered facility and associated resource that will satisfy the capacity obligation • A signed attestation declaring that the generator that will satisfy the capacity obligation meets the requirements of a capacity auction eligible storage resource as set out in Chapter 11, Definitions of the market rules. This attestation can be found in Appendix F: Attestation for Capacity Auction Eligible Storage Resource
Capacity dispatchable load resources	<ul style="list-style-type: none"> • The registered facility and associated resource that will satisfy the capacity obligation

<u>Capacity Auction Resource Type</u>	<u>Additional Information Required</u>
	<ul style="list-style-type: none"> • If there is no <u>registered facility</u>, the zonal location of the potential <u>capacity dispatchable load resource</u>. Participants may choose from the ten electrical zones to submit <u>capacity auction offers</u>
<u>System-backed capacity import resources</u>	<ul style="list-style-type: none"> • The external interface that will be used to deliver the <u>auction capacity</u> • A signed attestation acknowledging that all eligibility requirements have been met, as set out in Chapter 11, Definitions of the <u>market rules</u> and that has taken such actions as are necessary in order to ensure that: <ul style="list-style-type: none"> • <u>Capacity imports related to a capacity obligation will be offered into Ontario’s energy market with firm 7F transmission service; and</u> • <u>The planning authority(ies) responsible for adequacy assessment(s) will remove any MW related to a capacity obligation from its adequacy assessments</u> • <u>This attestation can be found in Appendix G: Attestation for System-Backed Capacity Auction Eligible Import Resource</u>
<u>Generator-backed capacity import resources</u>	<ul style="list-style-type: none"> • The external interface that will be used to deliver the <u>auction capacity</u> • A signed attestation acknowledging that all eligibility requirements have been met, as set out in Chapter 11 of the <u>market rules</u>, and that the <u>capacity auction participant</u> is the owner of the potential <u>capacity auction resource</u>. This attestation can be found in Appendix H: <u>Attestation for Generator-backed Capacity Auction Eligible Import Resource</u>. • <u>Proof of deliverability to the Ontario border in one of the following forms:</u> <ul style="list-style-type: none"> • <u>For generator-backed capacity auction eligible import resources located within the New York Independent System Operator (NYISO) control area, proof that the resource holds Capacity Resource Interconnection Service (CRIS) status; or</u> • <u>For generator-backed capacity auction eligible import resources located within the Hydro Quebec control area, confirmation of firm transmission service from the transmission operator</u> <p><u>For generator-backed capacity auction eligible import resources located within any control area, proof of ownership of a direct transmission line to the Ontario border</u></p> <p><u>In addition, for each generator-backed import contributor that is a generation facility, the following must be submitted:</u></p> <ul style="list-style-type: none"> • <u>Accredited UCAP rating as provided from an external jurisdiction</u> • <u>Fuel type</u> • <u>elapsed time to dispatch</u> • <u>minimum loading point</u> • <u>Resource name</u> • <u>Resource ID (i.e. the unique numeric identifier for the generation facility as assigned by an external jurisdiction)</u>

<u>Capacity Auction Resource Type</u>	<u>Additional Information Required</u>
	<p><u>For each generator-backed import contributor that is a storage facility, the following must be submitted:</u></p> <ul style="list-style-type: none"> • <u>The temperature-sensitive maximum power rating of the resource that can be sustained for 1 hour (Full Power Operating Mode)</u> • <u>The temperature-adjusted maximum amount of energy in MWh (Energy Rating), that the resource is capable of delivering when it is fully charged</u> <ul style="list-style-type: none"> • <u>The Full Power Operating Mode and Energy Rating will be used to determine the ICAP of a capacity storage resource using the following formula:</u> $ICAP = \left[\min \left(\text{Full Power Operating Mode}, \frac{\text{Energy Rating}}{4 \text{ hours}} \right) \right]$ <ul style="list-style-type: none"> • <u>Resource name</u> • <u>Resource ID (i.e. the unique numeric identifier for the storage facility as assigned by an external jurisdiction)</u>
<u>Hourly demand response (HDR) resources</u>	<ul style="list-style-type: none"> • <u>The registered facility and associated resource that will satisfy the capacity obligation</u> • <u>If there is no registered facility, the zonal location of the potential demand response resource and/or demand response contributors for which they are willing to submit offers, the obligation type (physical or virtual) and contributor type (Residential or Commercial & Industrial)</u>

Capacity Qualification Assessment

(Market Rules: Chapter 7, section 18.2A.1 and 18.2A.2)

Based on the information provided, ~~the IESO will:~~ by the participant as part of the capacity qualification request, the IESO will do the following to assess each capacity auction resource’s unforced capacity (UCAP):

- Verify that the ~~capacity auction market participant~~ has completed the pre-auction authorization process to become a capacity auction participant as outlined in [Section 3.2](#) of this manual, and
- Ensure that the capacity market participant has not been disqualified from capacity auction participation, ~~due to failure to reduce consumption or supply energy pursuant to a dispatch or~~ as outlined in Ch.7 of the market rules, and
- 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 capacity auction eligible generation resources, capacity auction eligible storage resources, and capacity dispatchable load resources

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:

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

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
- PAF is the Performance Adjustment Factor which reflects historical performance during a capacity auction capacity test activation notice (Ch.7, ss. 19.4.8, 19.9.4, 19.11.4 in the relevant summer or winter obligation period from two auctions prior, starting with the obligations periods associated with the 2022 capacity auction. It will be calculated in accordance with the formula in Section 5.4, 19.7.4, 19.9.4, and 19.11.4 of the market rules).³ Capacity Auction Capacity Test.

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

<u>Capacity Auction Resource Type</u>	<u>Availability De-Rating Factor</u>
<u>Capacity auction eligible generation resource</u> (Dispatchable Thermal)	<u>EFOR_d, which is the equivalent forced outage rate on demand based on 5 years of historical data.</u> <u>For capacity generation resources with less than 5 years of historical data, a proxy value of 7% will be used based on the median EFOR_d of Ontario's thermal generation fleet⁴</u>
<u>Capacity auction eligible generation resource</u> (Dispatchable Hydro)	<u>Median</u> $\left[\frac{\text{AQEI(MWh)} + \text{Scheduled Operating Reserve(MWh)}}{\text{MAPC}} \right]$ <u>in Top 200 hours of Ontario demand per season for the last 5 years</u> <u>Where:</u> <ul style="list-style-type: none"> • <u>AQEI is the Allocated Quantity of Energy Injected, in MWh</u> • <u>Scheduled OR is the Scheduled Operating Reserve in MWh</u> • <u>MAPC is the Maximum Active Power Capability, in MW, under any conditions without station service being supplied by the unit</u> <u>For capacity auction eligible generation resources 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.</u>
<u>Capacity auction eligible storage resource</u>	<u>EFOR_d, which is the equivalent forced outage rate on demand and is set at 5%</u>
<u>Capacity dispatchable load resource</u>	<u>Median</u> $\left(\frac{\text{hourly bids quantity}}{\text{maximum seasonal energy bid quantity}} \right)$ <u>in top 200 hours of Ontario demand per season</u> <u>For new capacity dispatchable load resources, a fleet specific class median will be applied.</u>

⁴ Median EFOR_d of Ontario's natural gas fleet excluding Lennox Generating Station.

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:

$$UCAP = \text{Externally Accredited UCAP} \times (1 - \text{PAF})$$

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. It will be calculated in accordance with the formula in Section 5.3 Capacity Auction Capacity Test.

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

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

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. It will be calculated in accordance with the formula in Section 5.3 Capacity Auction Capacity Test.

UCAP Assessment for hourly demand response resources

The formula for determining the maximum *UCAP* for *hourly demand response resources* is as follows:

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

Where:

- 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 obligations periods associated with the 2022 capacity auction. It will be calculated in accordance with the formula in Section 5.3 Capacity Auction Capacity Test. Where there is no data available because an HDR resource did not participate in a capacity auction capacity test in the relevant summer or winter obligation period, a weighted class average specific to each obligation period will be used.

Upon completion of the assessment, the IESO will notify capacity auction participants, via Online IESO, of the maximum UCAP that can be offered into the capacity auction for each potential capacity auction resource.

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 in the capacity auction.

3.4 Capacity Auction Deposit

##(Market Rules: Chapter 7, section 18.2.1.3, 18.3, 18.4)

Following receipt of the unforced capacity (UCAP) from the IESO, all capacity auction participants wishing to submit capacity auction offers into the capacity auction are each required to provide to the IESO a single capacity auction deposit, no less than five business days prior to the date which the submission of the capacity auction is to be conducted (Ch. 7, S.18.2.1 of the market rules). deposit is confirmed via Online IESO.

The purpose of this deposit is to establish the creditworthiness of the capacity ~~market~~ auction participant for auction activities. The ~~pre-capacity~~ auction deposit is also intended to ensure that the capacity auction participant fulfills any post-auction and forward period obligations.

The IESO will calculate the capacity auction deposit amount that a capacity auction participant is required to submit for each obligation period, based on the amount of enrolled UCAP determined for each capacity auction resource and in each obligation period of the capacity auction (Ch. 7, S. 18.3.1 of the market rules).

The formula for calculating a capacity auction participant's ~~pre-auction deposit amount in a capacity auction~~ deposit is as follows:

$$\text{Capacity auction deposit} = 3\% * (\text{total enrolled capacity UCAP} * \text{maximum auction clearing price per MW-day}) * \text{number of business days in obligation period}$$

The IESO may impose a higher capacity auction deposit requirement depending on creditworthiness of the capacity auction participant in the IESO-administered market.

For capacity obligation transfers, the IESO will determine and notify the capacity transferee if additional capacity auction deposit funds are required, as determined in Section 8, to complete a transfer.

If additional capacity auction deposit funds are required, the formula for determining a capacity transferee's deposit for a transfer is as follows:

Capacity auction deposit = $3\% * (\text{transferred } \textit{capacity auction capacity} * \text{maximum auction clearing price per MW day}) * \text{number of } \textit{business days in obligation period}$

However, the additional *capacity auction deposit* requirements from a transfer request may be satisfied by the *capacity transferee's* existing *capacity auction deposit*, if it has not been refunded back to the *capacity transferee*.

~~All *capacity auction participants* are required to submit a *capacity auction deposit* in one (or a combination of both) of the following forms:~~

- ~~• Irrevocable commercial letter of credit, in a form acceptable to the IESO (Ch.7, S.18.4.2 of the market rules), provided by an IESO-approved bank (Ch.7, S.18.4.1.1 of the market rules), or~~

~~Cash deposits made to the IESO by or on behalf of the authorized *market participant* (Ch.7, S.18.4.1.2 of the market rules). The IESO will not pay interest on cash deposits.~~

~~Letters of credit must be submitted to the IESO in original hard copy form.~~

Capacity auction deposits by cash may shall be submitted by *electronic funds transfer* to an IESO-designated account. Letters of credit must be submitted to the IESO in original hard copy form. The IESO will not pay interest on cash deposits.

The IESO will verify all submitted *capacity auction deposits* for participation in a *capacity auction* by:

- Reviewing the amount and type of deposit,
- Verifying that it meets the submission timing requirements, and
- Ensuring applicants are authorized as *capacity auction participants*.

The IESO will release the *capacity auction deposit*, at the *capacity auction participant's* request, within five *business days* for:

- An unsuccessful *capacity auction participant* after the publication date of the post-auction report;
- A successful *capacity auction participant* when the *capacity auction participant* is authorized as a *capacity market participant*, sufficient *capacity prudential support* is posted, and a *facility* is registered to satisfy each of the *capacity auction participant's capacity obligations* for each *obligation period*;

Upon completion of a successful *capacity obligation* transfer, the IESO will release all or a portion of a *capacity transferor's capacity auction deposit* at the *capacity transferor's* request, within five *business days* under the following conditions:

- The IESO will release the *capacity auction deposit* if the *capacity transferor's* remaining *capacity obligations* are 0 MW; or has at least one resource registered and sufficient *capacity prudential support* is posted to meet the *capacity auction participant's capacity obligation* in each *obligation period* in each of the cleared electrical zones; or
- The IESO will release a portion of the *capacity auction deposit*, if the above condition is not met, determined by the following formula:

Partial *capacity auction deposit* release = $3\% * (\text{transferred } \textit{auction capacity} * \text{maximum auction clearing price per MW day}) * \text{number of } \textit{business days in obligation period}$

– End of Section –

4. Auction Mechanics

The *capacity auction* mechanics involves a 3-stage process, as displayed in Figure 4-1 below:

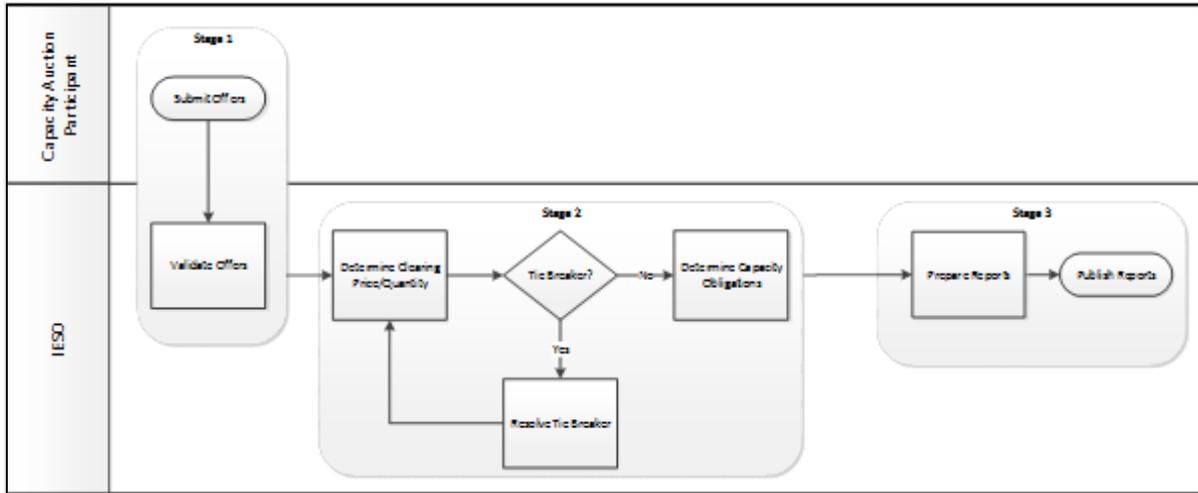


Figure 4-1: Capacity Auction Mechanics Overview

4.1 Stage 1: Offer Submission and Validation

Capacity auction participants are required to submit capacity auction offers via Online IESO, following the auction timelines detailed in [Section 2.2](#) of this *market manual*. Each capacity auction participant may submit a capacity auction offers associated with each potential capacity auction resource identified during the capacity enrollment/qualification process for any quantity between 1 MW and the *enrolled/unforced capacity (UCAP)* determined by the IESO during the pre-auction process, using offer laminations reflecting to reflect the price of providing the various levels of capacity.

Capacity auction offers must be submitted on an obligation period basis. A complete capacity auction offer includes a set of up to 20 monotonically increasing price-quantity pairs with the total offered quantity across all laminations equal to or less than the *enrolled capacity UCAP* for the potential capacity auction resource. The capacity auction offer quantity must increase with every new lamination added to an offer set (Ch.7, S. 18.6.3.2 of the *market rules*).

A capacity auction participant may revise a capacity auction offer in Online IESO up until the capacity auction offer window closes, per the timelines detailed in [Section 2.2 of this market manual](#).

A capacity auction offer will apply for the entire obligation period. The prices offered represent the minimum price at which the participant is willing to provide each incremental quantity of auction capacity.

A capacity auction offer must also specify, for each price-quantity pair, whether the entire auction capacity represented in the lamination must be cleared in full or whether it may be partially cleared (Ch.7, S. 18.6.3.4 of the *market rules*). A full flag indicates to the IESO that the capacity auction participant is only willing to clear the auction with the full amount of auction capacity offered in that

lamination. A partial flag indicates to the IESO that the *capacity auction participant* is willing to clear the auction in 0.1 MW increments of the offer in that lamination.

The participant must be ready to provide *auction capacity* in the amount of their *capacity obligation* by the first day of the *obligation period* or be subject to non-performance charges as explained in [Section 6 of this market manual](#).

4.2 Stage 2: Auction Clearing

(Market Rules: Chapter 7, section 18.7)

Once the *capacity auction offer* submission window closes, the IESO will review all *capacity auction offers* to determine the *capacity auction clearing price* for each zone, as per the timelines detailed in [Section 2 of this market manual](#).

For each *obligation period*, the IESO shall determine ~~for each obligation period~~ the *capacity obligation* for each *capacity auction participant's capacity auction resource* ~~(Ch. 7, S. 18.7.3 of the market rules)~~, following the process stated below.

The IESO will consider all *capacity auction offers* and clear them against a downward-sloping demand curve, utilizing an optimization model to maximize the social welfare (i.e. the area under the demand curve less supply costs). This clearing process will respect all *capacity auction zonal constraints* and capacity import constraints. The clearing process will determine the *capacity auction clearing price* for each zone. When there is a *capacity auction offer* not selected, either partially or in full, due to the total maximum *capacity auction zonal constraint for a specific electrical zone*, the *capacity auction clearing price* for that zone will be set at the lesser of:

- the price associated with the next economic quantity from a *capacity auction offer* in the same zone that would have cleared but for the total maximum *capacity auction zonal constraint*; or
- the Ontario-wide *capacity auction clearing price*.

When there is a *capacity auction offer* not selected, either partially or in full, due to the total maximum *capacity auction zonal constraint* for a group of electrical zones, the *capacity auction clearing price* for all zones incorporated in that group of zones that haven't reached their individual maximum *capacity auction zonal constraints* will be set at the lesser of:

- the price associated with the next economic quantity from a *capacity auction offer* in the same group of zones that would have cleared but for the total maximum *capacity auction zonal constraint*; or
- the Ontario-wide *capacity auction clearing price*.

The Ontario-wide *capacity auction clearing price* will be set equal to the price associated with demand curve for the quantity equal to the last-cleared *price-quantity pair* associated with a *capacity auction offer*. The total quantity cleared through a *capacity auction* may clear above the demand curve where doing so will maximize the overall objective function. An example of the auction clearing process, including zonal limitations, is shown in Figure 4-2.

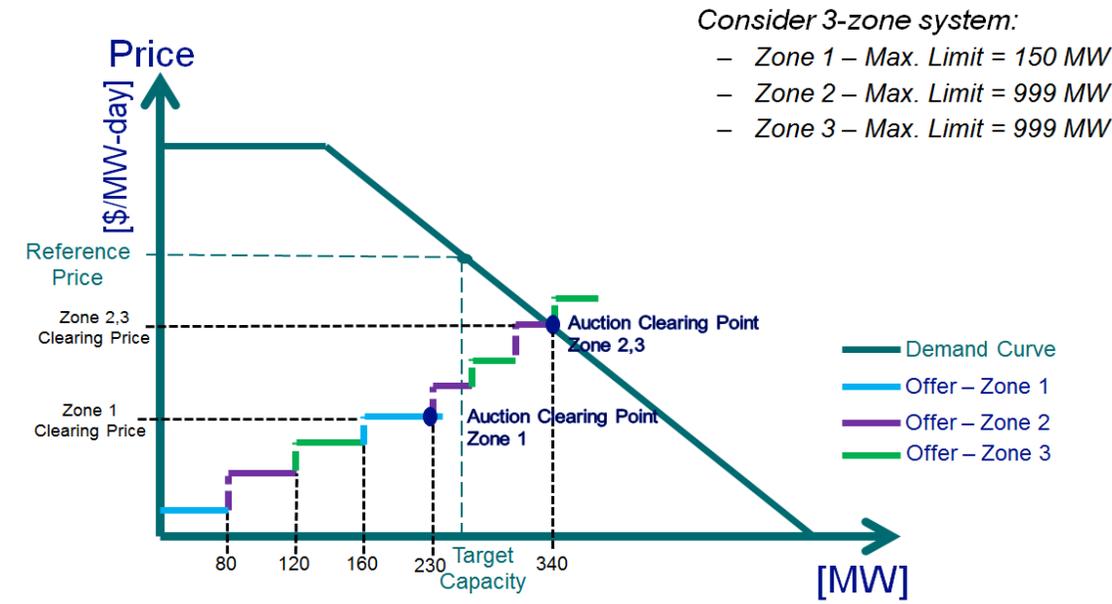


Figure 4-2: Auction Selection Process with Zonal Limits

In the example illustrated in Figure 4-2, Zone 1 has a total maximum *capacity auction zonal constraint* of 150 MW. All offers are stacked by increasing price against the demand curve for the *obligation period*. As shown in the figure, after clearing the first offer of 80 MW from Zone 1, the auction engine can only partially clear the second offer (70 MW) at which point the total cleared quantity in Zone 1 is equal to the total maximum *capacity auction zonal constraint*. If the auction engine determines that the un-cleared quantity from the second offer in Zone 1 would have cleared but for the total maximum *capacity auction zonal constraints*, a *zonal capacity auction clearing price* will be determined, in the manner described above. The overall procurement will continue and the *capacity auction offers* will clear until the intersection with the demand curve at 340 MW, which will also set the *capacity auction clearing price* for Zone 2 & 3, and is also referred to as the Ontario-wide *capacity auction clearing price*.

If the IESO receives two or more *capacity auction offers* at the same price for the last available quantity, the *capacity auction offer* with the earlier time stamp⁵ shall be selected as the successful *capacity auction offer* (Ch. 7, S. 18.7.5 of the market rules).

Once the *capacity auction clearing price* and quantity are set, the IESO shall determine for each *obligation period*, the *capacity obligations* for each *capacity auction participant* and its *capacity auction resource(s)* (Ch. 7, S. 18.7.4 of the market rules). Resources with a *capacity obligation* will be designated a *capacity auction resource* for the duration of the *commitment period*.

4.3 Stage 3: Post-Auction Reporting Obligations

(Market Rules: Chapter 7, section 18.8)

⁵ A time stamp refers to the time recorded by Online IESO when a *capacity auction participant* submits or revises an offer during the 2-business day offer submission window.

Once the auction has been cleared and *auction capacity* quantities and clearing prices are determined for all zones, the IESO will prepare public and private reports to communicate this information, as explained below.

The IESO shall *publish* public reports containing the following information for each *obligation period* (Ch.7, S. 18.8 of the *market rules*):

- The Ontario-wide *capacity auction clearing price*:
 - The *capacity auction clearing price* for each zone;
 - The amount of *auction capacity* acquired through the auction for each zone by obligation type (i.e. physical or virtual);
 - The successful *capacity auction participants* that received a *capacity obligation* and their respective total *capacity obligations* in each zone; and
 - The total *enrolled capacity amount of UCAP* of each *capacity auction participant* by obligation type and zone or external interface, as applicable.

~~The IESO shall *publish a summary of the Ontario-wide capacity auction clearing price and the auction capacity quantity across all zones.*~~

The IESO will also issue confidential post-auction reports to each *capacity auction participant* with the ~~*capacity obligation(s)*~~ following information for each *capacity auction resource*, ~~the *capacity auction clearing price* applicable to the *capacity auction resource*, and *obligation period*~~ (Ch.7, S. 18.8.2 of the *market rules*):

- *capacity obligation(s)* and *cleared ICAP*. The *cleared ICAP* will be calculated as follows:

$$\text{cleared ICAP} = \text{cleared UCAP} \times \left(\frac{1}{1-\text{PAF}} \right) \times \left(\frac{1}{\text{Availability De-rating Factor}} \right)$$

- the *capacity auction clearing price* applicable to the *capacity auction resource*, and;
- the *obligation period*

If *capacity obligations* are modified as a result of a buy-out or *capacity obligation* transfer, the IESO will prepare public and confidential reports to communicate the information, as explained above.

– End of Section –

5. Post-Auction Requirements

5.1 Participant Authorization

There are post-auction authorization and registration requirements for *capacity auction participants* who have successfully cleared and secured one or more *capacity obligations*. Such participants are required to become authorized as *capacity market participants* (Ch. 7, S.18.2.3 of the *market rules*). This authorization enables participants to participate in the energy market to satisfy a *capacity obligation*.

In addition to authorization as a *capacity market participant*, *market participants with generator-backed capacity import resources and system-backed capacity import resources must be authorized as an Energy Trader – Importer.*

In the case of *capacity market participants with system-backed capacity import resources or generator-backed capacity import resources*, all participation contact roles must be assigned to the *capacity market participant* or to an *affiliate* of the *capacity market participant*. Details with respect to contact roles are set out in “Market Manual 1.3: Identity Management Operations Guide”.

Post-auction *market participant* authorization processes are further detailed in “Market Manual 1.5: Market Registration Procedures”.

5.1.1 Prudential Support

All *capacity auction participants* with a *capacity obligation* are encouraged to post *capacity prudential support* for the *obligation period*, at least 60 days prior to the *obligation period*.

Further details on *capacity prudential support* requirements are outlined in “Market Manual 5.4: Prudential Support.”

5.2 Registration Requirements

(Market Rules: Chapter 7, sections 19.2, 19.3, 19.6, 19.8, 19.9A, 19.10)

The following section describes the registration requirements for participation in the *energy market*. All registration requirements are initiated and completed in Online IESO.

In order to satisfy a *capacity obligation* in the *energy market*, a resource registered in the *energy market* must be assigned to each *capacity obligation*. The *capacity auction resource* may be assigned during ~~capacity enrollment~~the *capacity auction participants’* submission of a *capacity qualification request* in the pre-auction period, or during the *forward period* (upon completion of registration of the *energy market resources*) for *demand response resources* that did not exist at the time of ~~capacity enrollment~~ (upon completion of registration of the *energy market resources*)-*qualification*. For *capacity auction participants with a system-backed capacity import resource or generator-backed capacity import resource*, a *boundary entity resource* will be automatically assigned to the *capacity obligation* during the *capacity auction participant’s* submission of a *capacity qualification request*, and registration of a *facility in the energy market is not required*. Any *market participant* seeking to register their *facility* and resource must follow the processes and timelines outlined in “Market Manual 1.5: Market Registration Procedures”.

This registration process must be completed at least 45 *business days* prior to the beginning of the *obligation period* for it to be effective as of the start of the *obligation period*. If the process is not completed by 45 *business days* before the start of the *obligation period*, the IESO cannot guarantee that the registration will be effective as of the start of the *obligation period* and this may have consequences related to non-performance charges. For clarity, under all circumstances, the registration process must be completed prior to the commencement of the *obligation period* or be subject to Ch. 7, S. 18.4.4 of the *market rules*. Upon completion, the *capacity market participant* can assign the newly registered *facility* with their applicable *capacity obligation*.

Except in the case of a [system-backed capacity import resource and generator-backed capacity import resource](#), the *capacity market participant* with a physical *capacity obligation* must be the registered owner, as described in “Market Manual 1.5: Market Registration Procedures”, of the *registered facility* associated with the *capacity auction resource*. *Capacity market participants* participating with [a generator-backed capacity import resource must be the owner of the generator backed import contributors as attested to during the submission of a capacity qualification request in the pre-auction period](#). *Capacity market participants* participating with virtual *HDR resources* may include physical or virtual *non-dispatchable loads* owned by a third party as *demand response contributors*.

Market participants that are seeking to change attributes of their resources (e.g., a resource may change its bid type [in the IESO’s registration system](#)), in the *IESO’s* registration system in order to satisfy a *capacity obligation* must complete the market registration process, including possible commissioning tests, 45 *business days* prior to the start of the *obligation period* for it to be effective as of the start of the *obligation period*. If the process is not completed by 45 *business days* before the start of the *obligation period*, the IESO cannot guarantee that the registration will be effective as of the start of the *obligation period* and this may have consequences related to non-performance charges. For clarity, under all circumstances, the registration process must be completed prior to the commencement of the *obligation period* or be subject to Ch. 7, S. 18.4.4 of the *market rules*.

Physical Demand Response [Resource](#)

To register a *facility* in accordance with “Market Manual 1.5: Market Registration Procedures”, a *capacity market participant* with a physical *capacity obligation* providing *demand response capacity* with a transmission connected *load facility* or with an *embedded load facility* that is revenue metered by the *IESO* must register their *demand response resource* as an *HDR resource* or as a *dispatchable load* (for example, a *non-dispatchable load* could be registered as an *HDR resource*). This *facility* registration includes the submission of *demand response capacity*.

A *capacity market participant* with a physical *capacity obligation* providing *demand response capacity* must register only one *demand response resource* for each *capacity obligation*.

Virtual Demand Response [Resource](#)

A *capacity market participant* with a virtual *capacity obligation* providing *demand response capacity* with a *facility* that is not revenue metered by the *IESO* must register their *demand response resource* as a virtual *HDR resource* and must register only one *demand response resource* for each *capacity obligation*. *Capacity market participants* with a virtual *HDR resource* must indicate the contributor type associated with such virtual *HDR resource* (residential or commercial/ industrial/ institutional load type, as applicable).

Capacity market participants with a virtual *capacity obligation* participating with a virtual *HDR resource* may include multiple *demand response contributors*, provided such *demand response contributors* are of the same contribution type as the virtual *HDR resource*. *Demand response contributors* for a virtual *HDR resource* may include multiple virtual (non-revenue metered) and/or physical (revenue metered) *non-dispatchable load(s)*. More information on the contributor management process is detailed in [Section 5.2.1](#).

A *capacity market participant* providing *demand response capacity* with both residential and commercial/industrial/institutional *demand response contributors* in the same zone must register two separate *HDR resources* in that zone (one for each contributor type).

5.2.1 Contributor Management

As part of the contributor management registration process, the *capacity market participant* must submit individual *demand response contributor* information via Online IESO that will be associated with their registered virtual *HDR resource(s)*. Each *capacity market participant* is responsible for maintaining its contributor registry throughout their *obligation period*.

The Online IESO interface allows *capacity market participants* to generate monthly contributor reports that provides a summary of their contributor participation information (resource IDs, meter point IDs, contributor type, and effective start/end dates), and corresponding *capacity obligations* secured under each of their respective virtual *demand response resource(s)*.

The *capacity market participant* must submit their *demand response contributor* information through Online IESO within the specified submission window, but no later than the 14th *business day* prior to the start date of the effective month. Contributor registration requests will be processed and responded to by the *IESO*, including notice of approval or rejection, at least four *business days* before the start of the effective month. Rejections and/or failure to submit appropriate registration information by specified deadlines will defer the effective date of the changes to the next effective month. Refer to the latest Demand Response Contributor Management and Measurement Data Submission Timelines posted on the IESO public Website under Market Calendars.

Capacity market participants must also retain individual contributor *meter* data and all relevant supporting information for each respective contributor. The *IESO* may request such information in order to verify the accuracy of information disclosed by the *capacity market participant* at the time of an audit as detailed in [Section 5.4](#).

There are two categories of *demand response contributors* that can be registered to meet a *capacity obligation* [for a virtual HDR](#):

1. Virtual *HDR resources* consisting of commercial, industrial, institutional and/or *non-dispatchable loads* (C&I) that can be classified as:
 - a. Virtual C&I HDR contributors; and
 - b. Physical C&I HDR contributors;
2. Virtual *HDR resources* consisting of residential⁶ smart-metered loads that can be classified as:

⁶A residential customer refers to a smart-metered service account that is billed (by a licensed local distribution company) on a residential-rate class specified in a rate-order produced by the *Ontario Energy Board*. For the purposes of this program the term 'residential', as intended by the *IESO*, excludes 'net-metered' and/or 'unit sub-metered' customers.

a. Virtual residential HDR contributors

Virtual C&I HDR Contributors registration requirements:

For virtual C&I HDR contributors, the information must satisfy the following applicable requirements:

- i. Contributor name and physical address (street, city, province, postal code), where the physical address must be in the same electrical zone as the associated *demand response resource*
 - The *capacity market participant* may use the zonal map tool located on the [IESO Zonal Map page \(http://www.ieso.ca/zonal.map/index.html\)](http://www.ieso.ca/zonal.map/index.html) to confirm the electrical zone for the associated *demand response contributor*;
- ii. Applicable licensed Local Distribution Company (LDC) name, and LDC account number indicated on the *demand response contributors'* LDC billing statement;
- iii. *Demand response contributor* load class type (i.e., industrial, commercial, and/or institutional);
- iv. Whether the demand response is to be provided via load interruption or behind-the-meter generation;
 - If demand response type is behind-the-meter generation, then the *capacity market participant* must specify the following *generator* name plate capacity information: model number, capacity in MW, fuel type and (if applicable) load following technology;
- v. Identification of whether the *demand response contributor* is participating in other demand response or conservation initiatives;
- vi. *Demand response capacity* of contributor in MW;
- vii. A declaration of acknowledgement by the *capacity market participant* that the LDC has been notified of the *demand response contributors'* participation in a *capacity auction*;
- viii. Data acquisition method used to collect *demand response contributor meter* data;
- ix. Submission of LDC Billing statement for each LDC meter installation that is issued within three months of the *demand response contributor* effective date;
- x. Submission of single line diagram (SLD) is required when the *demand response resource* type is behind-the-meter generation. SLD submissions (at a minimum) must include the following details:
 - Facility/contributor name, physical address
 - Embedded connection point(s) (point of sale) to the local distribution company (LDC)
 - Location of distribution transformer
 - Location of breakers, disconnect switches, etc.
 - Location of the metering installation and meter point reference identification (as indicated on contributors' Record of Installation)
 - If behind-the-meter generation, indicate generation location and nameplate information (MVA/kVA rating, output voltage)

Physical C&I HDR Contributors registration requirements:

For physical C&I HDR contributors, the information must satisfy the following applicable requirements:

- i. *Non-dispatchable load* Resource ID (subject to confirmation from *non-dispatchable load* owner); and
- ii. *Demand response capacity* in MW.

As part of the contributor management process, any updates, revisions or amendments to *demand response contributor* information applicable to C&I HDR resources must be submitted using Online IESO for review and approval, including when:

- A new *demand response contributor* is added;
- An existing *demand response contributor* is removed; or
- An existing *demand response contributor's* information is modified or amended.

In instances when a new *demand response contributor* is added and/or an existing *demand response contributor* is removed, subject to IESO's approval, the *capacity market participant* will be issued a new virtual meter point ID to reflect these changes. During a demand response activation event, the *capacity market participant* will be required to submit three months of measurement data under the issued virtual meter point ID, as detailed below.

Virtual Residential HDR Contributors registration requirements:

For virtual residential HDR contributors, the information submitted to the IESO must satisfy the following applicable requirements.

Submitted on a monthly basis through Online IESO using an excel template (refer to Appendix A):

- i. *Demand response contributor* physical address (in the order of: street# & name, city, province, postal code), where the physical address must be in the same electrical zone as the associated demand response resource;
 - The *capacity market participant* may use the zonal map tool located on the [IESO Zonal Map page \(http://www.ieso.ca/zonal.map/index.html\)](http://www.ieso.ca/zonal.map/index.html) to confirm the electrical zone for the associated contributor;
- ii. Applicable licensed Local Distribution Company (LDC) name and LDC account number indicated on contributors' LDC billing statement;
- iii. Indicator flagging the control group *demand response contributors*, as defined in the section entitled "Randomized Control Trial Baseline Methodology" below, where there must be at least 350 control group *demand response contributors* which are chosen randomly (i.e. using a process of selection in which each contributor has an equal probability of being chosen) each month by the *capacity market participant* from the total population of *demand response contributors* under the residential HDR resource;

The following fields must be directly entered into the input fields in Online IESO:

- iv. *Demand response capacity* in MW (note: the total capability from only the treatment group contributors and must be equal to or greater than 1 MW);

- v. Total number of *demand response contributors* in the treatment group as defined in the section entitled “Randomized Control Trial Baseline Methodology” below; and
- vi. Total number of *demand response contributors* in the control group.

As part of the residential contributor management process, the *capacity market participant* shall use the excel template available in Online IESO (refer to Appendix A) to submit *demand response contributor* information on a monthly basis.

Rejections and/or failure to submit appropriate contributor management registration information each month by the specified deadlines will exclude the residential *HDR resource* to participate in the energy market (submit energy bids) for that month, and result in Availability Charges to be applied (as further described in “Market Manual 5, Part 5.5: Physical Markets Settlement Statements”).

Randomized Controlled Baseline Methodology

For *HDR resources* associated with either virtual or physical C&I contributors, performance is evaluated using a historical baseline (as described in Market Manual 5.5: Physical Markets Settlement Statements).

For *HDR resources* associated with virtual residential *demand response contributors*, a randomized controlled (RC) baseline methodology is used where two groups of contributors are established, as follows:

- A “treatment” group, where *demand response contributors* are activated to provide demand response upon receipt of the demand response standby and activation notice; and
- A randomized “control” group, where *demand response contributors* serve as a proxy for baseline consumption; therefore, are not activated to provide demand response. The “control” group *demand response contributors* are randomly selected using a process of selection in which each *demand response contributor* has an equal probability of being chosen each month.

The RC evaluates the consumption difference between the two groups of *demand response contributors* to determine the amount of *demand response capacity* delivered, as illustrated in Figure 5-1.

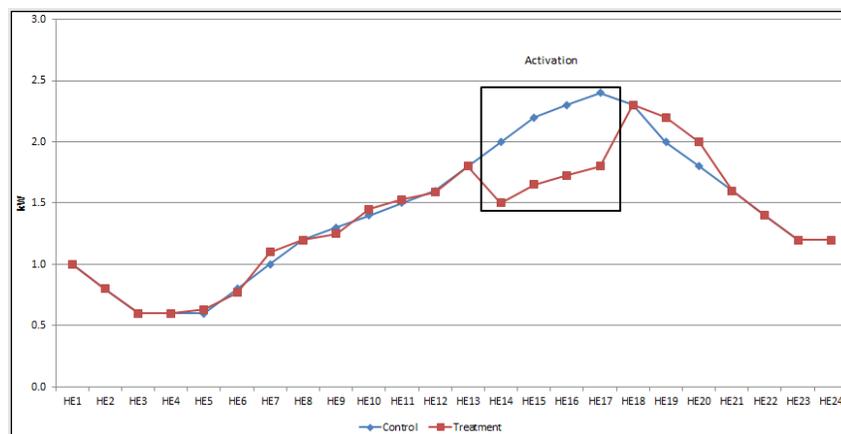


Figure 5-1: Randomized Control Trials (RC) performance evaluation

Refer to “Market Manual 5.5: Physical Markets Settlement Statements” for a further description of how residential HDR performance is evaluated and how settlements are calculated.

5.3 Energy Market Participation

In order to satisfy their *capacity obligation(s)*, *capacity market participants* will be required to submit *dispatch data* in the day-ahead commitment process as set out in “Market Manual 9.2: Submitting Operational and Market Data for the DACP”, and in the *real-time market* as set out in “Market Manual 4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets.” *Capacity market participants* are required to follow *dispatch instructions* as set out in “Market Manual 4.3: Real-Time Scheduling of the Physical Markets.”

All *capacity auction resources* will be subject to test activations in the *real-time market*, as set out in [Section 5.3.3-this section below](#). *Capacity market participants* with *capacity obligation(s)* allocated to *HDR resources* will be compensated for out of market activations, including [capacity auction dispatch test activations](#), as detailed in “Market Manual 5.5: Physical Markets Settlement Statements.”

5.3.1 Outage Management/ Non-Performance Events

Capacity market participants with a *capacity auction resource*, except for *capacity market participants* with [system-backed capacity import resources](#), are required to submit *outage* requests as set out in “Market Manual 7.3: Outage Management.” *Capacity market participants* with *HDR resources* are required to inform the *IESO* of non-performance events⁷ as set out in Market Manual 7.3.

5.3.2 Measurement Data Submissions

For Virtual C&I HDR resource (s):

Each [Virtual C&I HDR resource](#) is associated with a virtual meter point ID that reflects *demand response contributor* changes to a *capacity market participant’s* virtual portfolio. *Capacity market participants* are required to submit three months of aggregated measurement data (on a five-minute interval basis) through Online IESO only for months in which they are activated for their demand response *capacity obligations*. The Online IESO data submission must include measurement data for the activation month and two previous months of historical data in a single three-month data file per virtual meter point ID.

Processing of Measurement Data

Virtual C&I *HDR resource* will have either a uni-directional meter (kWh delivered) or a bi-directional meter (kWh delivered and kWh received). *Capacity market participants* must adhere to the following methodology when aggregating *demand response contributor* meter data and submitting a consolidated three-month measurement data file:

- Virtual *demand response contributors* with a uni-directional meter type, the uni-directional interval meter readings will be recorded in the summation of Channel 1 (kWh delivered) energy quantities. Channel 2 (received) energy is recorded as zero for that *demand response contributor*
- Virtual *demand response contributors* with a bi-directional meter type, the *demand response contributor’s* bi-directional interval meter readings must be netted (kWh delivered – kWh received) and recorded as follows:

⁷ Non-performance event means an event determined by the *CMP* where a *demand response resource* is, in whole or in part, in a Demand Response *Outage* or otherwise unable to Curtail for a period of time.

- if the resultant net kWh quantity is less than or equal to zero, then the total net kWh value will be zero and is recorded in the summation of Channel 1 (delivered) energy quantity for that interval. Channel 2 (received) energy is recorded as zero for that interval, or
- if the resultant net quantity is greater than zero, then the total net value will be equal to the net amount and will be included in the summation of Channel 1 (delivered) energy quantity for that interval. Channel 2 (received) energy is recorded as zero for that interval

The measurement data submission is the summation of all *demand response contributors* by channel per interval.

File Format Requirements for Measurement Data Submissions

Measurement data submitted by *capacity market participants* through Online IESO, must adhere to the following requirements:

- Must not include any measurement error corrections,
- Must not include any loss adjustments,
- Must be provided in the following format:
 - A CSV (comma separated values) file format compatible with the IESO's Meter Data Acquisition System, containing two channels of 5-minute engineering unit values (without any gaps or overlaps).
 - The CSV data file shall adhere to the following format (separated by commas) corresponding to each column name, as illustrated in Figure 6-2 below,
 - Row 1 (Main header): "DATE,TIME,CH1,CH2"
 - Row 2 (Data intervals): "YYYY/MM/DD, HH:MM, ###.###,###.###", where:
 - Date: "YYYY/MM/DD", as in year/month/day
 - Time: "HH:MM", hour: minutes in Eastern Standard Time (EST),
 - Channel 1: Summation of all virtual contributors' energy withdrawn from the grid, in Numeric "###.###," in kWh up to three decimal places,
 - Channel 2: Summation of all virtual contributors' energy injected into the grid, in Numeric "###.###," in kWh up to three decimal places, and
 - The CSV data file must contain 288 rows of data per day, having a beginning time of 00:05 and an end time of 24:00.

```

DATE, TIME, CH1, CH2
2017/05/01, 00:05, 111.222, 0
2017/05/01, 00:10, 333.444, 0
...
.....
2017/05/01, 23:55, 555.666, 0
2017/05/01, 24:00, 777.888, 0

```

Figure 5-2: Sample CSV File Format for Measurement Data Submission for C&I HDR

For Virtual Residential HDR resource (s):

Capacity market participants are required to submit aggregated hourly (60-minute interval) measurement data only for days in which they received demand response activations during the commitment month. Measurement data (single data file per virtual meter point ID for all activation days) must be submitted for each of the two groups of *demand response contributors* (treatment and control group) through Online IESO in accordance with the latest Contributor Management Timelines posted on the IESO public Website under Market Calendars.

Subject to IESO's approval, the *capacity market participant* will be assigned two unique Meter point IDs (MPID), one for the treatment group and one for the control group. The MPID format for each group is as follows:

- DRAT##### to represent the treatment group *demand response contributors*, and
- DRAC##### to represent the control group *demand response contributors*.

File Format Requirements for Measurement Data Submissions

Measurement data submitted by *capacity market participants* through Online IESO must adhere to the following requirements:

- Must not include any measurement error corrections,
- Must not include any loss adjustments,
- Must be provided in the following format:
 - A CSV (comma separated values) file format containing two channels of 60 minute engineering unit values (without any gaps or overlaps),
 - The CSV data file shall adhere to the following format (separated by commas) corresponding to each column name, as illustrated in Figure 5-3 below,
 - Row 1 (Main header): "DATE,TIME,CH1,CH2"
 - Row 2 (Data intervals): "YYYY/MM/DD, HH:MM, ###.###,###.###", where:
 - Date: "YYYY/MM/DD", as in year/month/day
 - Time: "HH:MM", hour:minutes in Eastern Standard Time (EST),
 - Channel 1: Summation of all virtual contributors' withdrawn energy in kWh up to three decimal places, in numeric value "###.###",

- Channel 2: Shall remain zero (with respect to the exclusion of 'net-metered' customers under residential HDR),
- o The CSV data file must contain 24 rows of data per day, having a beginning time of 01:00 and an end time of 24:00.

```
DATE , TIME , CH1 , CH2
2017/05/01 , 01 : 00 , 111 . 222 , 0
2017/05/01 , 02 : 00 , 333 . 444 , 0
...
.....
2017/05/01 , 23 : 00 , 555 . 666 , 0
2017/05/01 , 24 : 00 , 777 . 888 , 0
```

Figure 5-3: Sample CSV File Format for Measurement Data Submission for Residential HDR

Timelines for Data Submission and Processing

Upon activation, *capacity market participants* must submit their measurement data no later than the 6th *business day* before the end of the subsequent month. Refer to the latest Demand Response Contributor Management and Measurement Data Submission Timelines posted on the IESO public Website under Market Calendars for details.

The IESO will process all measurement data submissions and respond to the *capacity market participant* with notice of any errors by the 4th *business day* prior to the start of the effective month. The *capacity market participant* will then have (at a minimum of) two *business days* from the date the IESO provides such notice to correct and resubmit a revised measurement data file through Online IESO. Measurement data submissions not submitted by the specified deadlines will incur non-performance charges in accordance with Ch. 9, S. 4.7J of the *market rules*.

Capacity market participants must retain individual *demand response contributors* measurement data and all supporting information provided at the time of registration, for audit purposes for a period of seven (7) years. The IESO may request such information in order to verify the accuracy of information disclosed by the *capacity market participant*.

Validation, Estimation and Editing (VEE) Process for Virtual C&I HDR Contributors

For virtual C&I HDR contributors, if the *capacity market participant* has identified, within the measurement data submission deadline, that a portion of the measurement data is missing for particular *demand response contributor* (s), the *capacity market participant* shall:

- Collect data for all *demand response contributors* for the period of three months excluding the missing period
- Utilize the following Validation, Estimation and Editing (VEE) criteria for virtual C&I HDR contributors to account for the missing period:
 - o If the data is missing for any period outside the hours of a demand response activation event; measurement data for the missing period will be estimated to zero.
 - o If the data is missing for any period within the demand response activation event; the *capacity market participant* shall take the highest 5 min interval energy value (kWh) from the entire three-month data set and estimate the missing period with that value.

Capacity market participants must submit a “Measurement Data Control Sheet” with each measurement data submission identifying *demand response contributors* with VEE data (if applicable). A template of the “Measurement Data Control Sheet” can be found in Appendix B.

At the time of an audit, the IESO shall take into account all supporting information provided by the *capacity market participant* including measurement data submitted during the *commitment period*, the actual measurement data submitted at the time of the audit along with the measurement data control sheet (if applicable).

5.3.3 Testing of Capacity Auction Resources

Capacity Auction Capacity Tests

([Market Rules: Chapter 7, sections 19.4.11.A, 19.5.7A, 19.7.7A, 19.11.7.A](#))

The IESO will direct applicable capacity auction resources to perform one capacity auction capacity test per obligation period.

HDR Resources, Capacity Dispatchable Load Resources, Capacity Generation Resources, and Capacity Storage Resources

To execute a capacity auction capacity test, the IESO will determine a five-business day window (“testing window”) for each obligation period within which applicable capacity auction resources will be required to ensure they are scheduled in the energy market for a resource-specific amount of time, as detailed below, within the applicable availability window. The IESO will issue an advisory notice indicating when the testing window will be scheduled, a minimum of 10 business days in advance of the testing window.

Capacity auction capacity tests for these capacity auction resources are conducted as follows:

- Capacity auction resources must submit demand response energy bids or energy market offers to ensure they receive a generation (for capacity generation resources and capacity storage resources) or load curtailment (for capacity dispatchable load resources) schedule/activation in the energy market to the greater of their cleared ICAP or their minimum loading point (for capacity generation resources) during the testing week within the availability window for the following durations:
 - Capacity generation resources (quick start and non-quick start generators), capacity storage resources, and hourly demand response resources (HDRs) – four consecutive hours
 - Capacity dispatchable loads – three consecutive dispatch intervals

Note – the demand response bid price thresholds for HDRs and capacity dispatchable loads will be removed for all hours of the availability window during the testing window.

Data Submission Requirements

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 can be sent in the form of an email to capacity.auction@ieso.ca with the subject heading “Capacity Auction Capacity Test: “Participant Name, Obligation ID”, and must be sent by the following due date:

- For capacity dispatchable load resources, capacity generation resources and capacity storage resources, no later than five business days after the end of the testing window,
- For HDR resources, no later than the 6th business day before the end of the subsequent month following the testing window

Failure of a capacity market participant to notify the IESO by the applicable deadline may result in non-performance charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements” and the application of a performance adjustment factor as described below in this section.

Performance Assessment

The IESO will assess the performance results of the capacity auction capacity test using the following parameters:

- For a capacity generation resource, capacity storage resource or hourly demand response resource, the capacity auction capacity test will be deemed a pass if the capacity auction resource delivered, on average for each hour of its 4 consecutive hour test duration, at least its

cleared ICAP within the specified threshold of 10% for HDR resources and 5% for capacity generation resources and capacity storage resources.

- If the capacity auction resource fails to deliver, on average for any hour of the test, at least its cleared ICAP within the specified threshold the test will be deemed a fail.
- For a capacity dispatchable load resource, the capacity auction capacity test will be deemed a pass if the capacity auction resource delivered at least its cleared ICAP for each dispatch interval of the 3 consecutive interval test requirement, within the 5% threshold.
 - If the capacity auction resource fails to deliver at least its cleared ICAP for any interval of the test, within the 5% threshold, the test will be deemed a fail.

If the test is deemed a pass, the Performance Adjustment Factor (PAF) applied to the capacity auction resource for the corresponding summer/winter obligation period in the next applicable capacity auction, as indicated in Appendix D: Performance Adjustment Factor Summary by Year, will be zero. Failure of the capacity auction capacity test will result in the applicable non-performance charges as specified in “Market Manual 5.5: Physical Market Settlements”. The PAF to be applied for the corresponding summer/winter obligation period in the next applicable capacity auction, as indicated in Appendix D: Performance Adjustment Factor Application by Year, will be calculated according to the formula below:

$$PAF_{\text{summer or winter}} = 1 - (\text{delivered MW} / \text{cleared ICAP})$$

Where:

Delivered MW is equal to:

- For capacity generation resources, capacity storage resources and hourly demand response resources, the average amount of auction capacity delivered by the capacity auction resource over one hour, in the hour of the capacity auction capacity test with the lowest performance.
- For capacity dispatchable load resources, the average amount of auction capacity curtailed by the capacity auction resource over the 3 consecutive dispatch intervals

If the capacity market participant does not notify the IESO of their completed capacity auction capacity test, or does not notify the IESO by the deadline, the IESO will not have the data needed to calculate the “delivered MW” (i.e. the capacity market participant did not notify the IESO of the completed capacity auction capacity test by the deadline). In these cases, the “delivered MW” will be set at 75% of the capacity auction resource’s cleared ICAP resulting in a PAF of 0.25.

Allowable Exceptions

In limited circumstances, the IESO may consider scheduling a second testing window if a capacity auction resource is unable to complete the capacity auction capacity test during the entirety of the first testing window. These circumstances are as follows:

1. The capacity auction resource is unable to comply with the capacity auction capacity test in accordance with their energy offer/demand response bid during the testing window due to an outage caused by a third party market participant. In such cases, the capacity market participant must notify the IESO by emailing capacity.auction@ieso.ca no later than five business days after the end of the testing window and provide evidence, originating from the third party market participant, that the failure to complete the capacity auction capacity test was due to the actions of the third party.
2. The capacity auction resource is unable to comply with the capacity auction capacity test in accordance with their energy offer/demand response bid during the testing window due to a force majeure event. In such cases, the capacity market participant must adhere to the force

majeure requirements as outlined in Ch. 1, Section 13.3 of the *market rules*, and also must notify the IESO of the inability to complete the *capacity auction capacity test* by emailing capacity.auction@ieso.ca no later than 5 *business days* following the end of the testing window. In the email, the *capacity market participant* must provide proof that they have adhered to the force majeure requirements in the *market rules*. If the IESO is satisfied that the *capacity market participant* has met the notification requirements for a *force majeure event*, and the force majeure conditions have been met, a subsequent testing window may be rescheduled at the discretion of the IESO.

Non-performance charges associated with these two circumstances will be assessed in accordance with section 1.6.26.4 of “Market Manual 5.5: Physical Markets Settlement Statements”.

If the *capacity auction resource* is unable to comply with the *capacity auction capacity test* during a rescheduled testing window, the test will be deemed a failure. Failure of the *capacity auction capacity test* will result in the applicable non-performance charges as specified in “Market Manual 5.5: Physical Market Settlements” and a PAF of 0.25 will be applied for the corresponding summer/winter obligation period in the next applicable *capacity auction*, as indicated in [Appendix D: Performance Adjustment Factor Application by Year](#).

Generator-Backed Capacity Import Resources

To complete a *capacity auction capacity test* for a *generator-backed capacity import resource*, the *capacity market participant* must:

- Submit data to the IESO confirming the capability of each *generator-backed import contributor* to inject, in aggregate, at least 95% of the *generator-backed capacity import resource’s cleared ICAP* into the grid of the host *control area* in which it is located for four consecutive hours within the *availability window*, on a date that falls within the first two months of the applicable *obligation period*, and;
- Successfully schedule an import transaction equal to or greater than the *cleared ICAP* from the host *control area* into Ontario at the relevant intertie for at least one hour that coincides with the timing of the scheduled four-hour activation in the host *control area* being used to confirm capability of the *generator-backed capacity import resource*.

Data Submission Requirements

The data submission for each *generator-backed import contributor* must consist of revenue-grade meter data that meets the market participation requirements of the host *control area operator* in which it is located, and must include the following:

- Resource ID of the *generator-backed import contributor(s)* associated with the *generator-backed capacity import resource*
- Date (YYYY/MM/DD), hours (HH), and intervals (MM) the *capacity auction capacity test* was completed
- MWh injected for each interval, provided to two decimal places

The data shall be provided on a five-minute interval basis and shall be verified as complete and accurate by the host *control area operator*. The data submission must be sent as an excel file to capacity.auction@ieso.ca and should have the subject heading “Capacity Auction Capacity Test:

Participant Name, Obligation ID”. A sample template for the data submission can be found in [Appendix C: Template for Generator-Backed Capacity Import Resource Capacity Test Data Submission](#).

Timelines for Data Submission

The data set must be provided to the IESO no later than five business days following the end of the second month of the *obligation period* for which the data relates. The IESO will review all data submissions and respond to the *capacity market participant* with notice of any errors or clarifications. The *capacity market participant* will then have (a minimum of) two *business days* from the date the IESO provides such notice to respond, or correct and resubmit the data file to capacity.auction@ieso.ca.

Failure of a *capacity market participant* to provide the data set in a timely, complete or accurate manner may result in non-performance charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements” and the application of a performance adjustment factor as described below in this section.

Performance Assessment

The IESO will assess the results of the *capacity auction capacity test* using the following parameters:

- If the *generator-backed capacity import resource* demonstrates, through their data submission, an injection of electricity into the host *control area’s* grid equal to their *cleared ICAP* within a threshold of 5% for four consecutive hours within the required date and time, and successfully scheduled the corresponding import transaction for at least its *cleared ICAP* into Ontario for at least one hour during the same time period, the test will be deemed a pass.
- If the test is deemed a pass, the Performance Adjustment Factor (PAF) applied to the *capacity auction resource* in the applicable future auction will be zero.
- Failure of the *capacity auction capacity test* will result in the applicable non-performance charges as specified in “Market Manual 5.5: Physical Market Settlements”. The PAF to be applied for the corresponding summer/winter obligation period in the next applicable *capacity auction*, [Appendix D: Performance Adjustment Factor Application by Year](#), will be calculated according to the formula below:

$$PAF_{\text{summer or winter}} = 1 - (\text{delivered MW} / \text{cleared ICAP})$$

Where:

Delivered MW is equal to the minimum of:

- the average amount of *auction capacity* delivered by the *capacity auction resource* over one hour, in the hour of the *capacity auction capacity test* with the lowest performance (i.e. the average amount of *auction capacity* delivered in aggregate by all *generator-backed import contributor(s)* associated with the *generator-backed capacity import resource* in the host *control area*), or;
- the amount of *auction capacity* scheduled in the corresponding import transaction.

If supporting data is missing to calculate the “delivered MW” (i.e. data was not submitted), or if supporting data is not submitted by the deadline, then the “delivered MW” will be set at 75% of the *generator backed capacity auction resource’s cleared ICAP* resulting in a PAF of 0.25.

Allowable Exceptions

In limited circumstances, the IESO may consider scheduling a second testing window if a *generator-backed capacity auction resource* is unable to complete the *capacity auction capacity test* at all during the entirety of the first testing window. These circumstances are as follows:

1. The *capacity auction resource* is unable to comply with the *capacity auction capacity test* in accordance with their *energy offer* during the testing window due to a *force majeure event*. In such cases, the *capacity market participant* must adhere to the force majeure requirements as outlined in Ch. 1, Section 13.3 of the *market rules*, and also must notify the *IESO* of the inability to complete the *capacity auction capacity test* by emailing capacity.auction@ieso.ca no later than 5 *business days* following the end of the testing window. In the email, the *capacity market participant* must provide proof that they have adhered to the force majeure requirements in the *market rules*. If the *IESO* is satisfied that the *capacity market participant* has met the notification requirements for a *force majeure event*, and the force majeure conditions have been met, a subsequent testing window may be rescheduled at the discretion of the *IESO*.

If the *capacity auction resource* is unable to comply with the *capacity auction capacity test* during a rescheduled testing window, the test will be deemed a failure. Failure of the *capacity auction capacity test* will result in the applicable non-performance charges as specified in “Market Manual 5.5: Physical Market Settlements” and a PAF of 0.25 will be applied for the corresponding summer/winter obligation period in the next applicable *capacity auction*, as indicated in [Appendix D: Performance Adjustment Factor Application by Year](#).

System-Backed Capacity Import Resources

The *IESO* may direct *system-backed capacity import resources* to perform up to two *capacity auction capacity tests* per *obligation period* for each *capacity auction resource* to verify that the *auction capacity is deliverable*. Tests will be scheduled to occur during the *availability window* of the *dispatch day*.

The tests ~~are~~will be conducted as follows:

- Up to two hours in advance of any *test*, applicable *system-backed capacity import resources* will receive a constraint and a schedule should appear in PD-1. Tests may be scheduled for a duration of up to four consecutive hours.
- If a *system-backed capacity import resource* being tested *is successfully scheduled in pre-dispatch* and not curtailed as per “Market Manual 4.3: Real-Time Scheduling of the Physical Markets”, the test will be deemed a success.
- Failure of the test will result in the applicable charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements.”

In advance of the scheduled test activation, if the *capacity market participant* is *aware they will be unable* to comply with the *scheduled* test activation of the *auction capacity* on the *dispatch day*, it is the responsibility of the *capacity market participant* to notify the *IESO* *about its inability* to *start* and *complete the* test activation. *capacity market participant is also required to update* its *energy offers* in accordance with “Market Manual 4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets”. *If the affected capacity market participant has notified the IESO accordingly and updated its energy offers where applicable, the test will not be deemed a failure and the IESO may reschedule the test activation for the affected capacity market participant.*

The *IESO* may determine a test activation for a *system-backed capacity import resource* is not required if all the following criteria are met. The:

- *system-backed capacity import resource* receives and follows sufficient *dispatch instructions* in the *energy market*,
- dispatches are within the *availability window*, and
- *system-backed capacity import resource* demonstrates that its *capacity obligation* *has been met*.

Failure of a system-backed capacity import resource to perform a successful test activation may result in one or more of the following:

- Non-performance charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements,”
- A subsequent test activation to be scheduled by the IESO, or
- Referral to the Market Assessment and Compliance Division

Capacity Auction Dispatch Tests

(Market Rules: Ch. 7, S. 19.4.1.1)

The IESO reserves the right to perform up to two capacity auction dispatch tests per obligation period to validate a capacity auction resource’s ability to deliver against their bid/offer quantity with minimal notice. Capacity auction dispatch tests for all applicable capacity auction resource types will be scheduled for a duration of up to four hours within the availability window of the dispatch day.

The IESO may determine a capacity auction dispatch test for a capacity auction resource is not required if all the following criteria are met:

- the capacity auction resource has demonstrated its ability to follow dispatch instructions within compliance dead-bands in the energy market, and
- dispatches are within the availability window.

The IESO may schedule a capacity auction dispatch test for a capacity auction resource regardless of whether the above conditions are met.

A capacity auction resource that fails their capacity auction dispatch test may be subject to one or more of the following:

- Non-performance charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements,”
- A subsequent dispatch test activation to be scheduled by the IESO, or
- A compliance investigation Referral to be performed by the IESO Market Assessment and Compliance Division.

Testing of Capacity Generation Resources, Capacity Storage Resources, and Capacity Dispatchable Load Resources

The IESO may direct Capacity auction dispatch tests for these capacity dispatchable load auction resources to perform up to two activation tests per obligation period, to verify that the capacity dispatchable load resource is capable of satisfying the capacity obligation. Tests will be scheduled to occur during the availability window of the dispatch day.

The tests are conducted as follows:

- Applicable resources will be contacted by the IESO for test details. The IESO will contact apply a constraint to the resource’s offered MW amount in advance of the capacity market participant auction dispatch test up to one:
 - One hour in advance of any exercise.

- ~~The resource will have a constraint applied to *withdraw to its for capacity obligation* for the duration of the test.~~
- ~~The *registered market participant* for the *facility* must ensure *generation resources that bids are submitted* related to the test.~~
 - ~~If a resource being tested demonstrates a reduction in *energy withdrawal* from the IESO controlled grid equal to or greater than the *quick start facilities and capacity obligation* for every interval for the duration (up to 4 hours) of the test, the test will be deemed a success. *storage resources.*~~
 - ~~Failure *One business day for capacity generation resources* that are *non-quick start facilities* in the day-ahead timeframe and prior to the day-ahead commitment process.~~
- ~~*Capacity dispatchable loads* will have a constraint applied to curtail up to their bid MW amount up to one hour in advance of the *capacity auction dispatch test* will result in the.~~

~~If the *capacity auction resource* demonstrates it was able to follow its *dispatch instructions* within the applicable *charges compliance dead band* as specified in “per the Market Manual 5, Part 5.5: Physical Markets Settlement Statements” Rule Interpretation Bulletin (IMO MKRI 0001), the test will be deemed a pass.~~

~~If a *capacity dispatchable load resource* is In advance of the scheduled test activation, if the *capacity market participant* is aware of a planned or forced outage that will make the *capacity auction resource* unable to comply with the ~~test activation~~ *capacity auction dispatch test* in accordance with their *offered/bid MW amount* on the *dispatch day*, it is the responsibility of the *capacity market participant* to notify the IESO *about its inability to start and complete the test activation*, according to the *outage reporting requirements specified for dispatchable loads for the applicable capacity auction resource type* as specified in “Market Manual 7.3: Outage Management” and update the *demand response energy offers/bids* in accordance with “Market Manual 4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets”. ~~Subsequent test activations will be rescheduled by the IESO following the completion of the outage.~~~~

~~For The *capacity market participant* with a *capacity dispatchable load generation resource*, a test is deemed a success if the resource demonstrates a reduction in *energy withdrawal* that is equal to its *capacity obligation*. The IESO may determine a test for a *dispatchable load resource* is not required if a *non-quick start facility* assumes the risk of failing the:~~

- ~~*dispatchable load* receives and follows sufficient *dispatch instructions* in the *energy market*,~~
- ~~*dispatches* are within the *availability window*, and~~
- ~~*dispatchable load* demonstrates that the *capacity obligation* has been met.~~

~~The IESO may schedule test activation for *capacity dispatchable load resources* regardless of whether the above conditions are met, if there is evidence that the resource is not able to deliver its *capacity obligation* at any time if a forced outage occurs during the *obligation ramp-up period*.~~

~~Failure of a *capacity dispatchable load* resulting in the resource *being unable* to perform successful deliver its offered/bid MW amount during the scheduled test activation may result in one or more of the following:~~

- ~~Non-performance charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements,”~~

- A subsequent test activation to be scheduled by the IESO, or
- A compliance investigation to be performed by the IESO.

Testing of If the affected capacity market participant has notified the IESO accordingly and updated its energy offers/bids where applicable, the capacity auction dispatch test will not be deemed a failure and may be rescheduled by the IESO following the completion of the outage.

Hourly Demand Response Resources

~~The IESO may direct HDR resources to perform up to two activation tests per obligation period. These tests are conducted by the IESO to assess an HDR resource's ability to demonstrate a reduction in energy withdrawal from the IESO-controlled grid equal to or greater than the capacity obligation of the resource. The IESO will provide notification to capacity market participants one day in advance of the test with the actual test itself occurring during the availability window of the dispatch day. Testing for HDR resources is conducted for four hours, unless an HDR resource is qualified for reduced test duration.~~

~~For test activations, capacity~~ Capacity auction dispatch tests for HDR resources will be conducted as follows:

- Capacity market participants with HDR resources will receive a standby notice on the pre-dispatch day and an activation notice approximately 2 hours and 30 minutes in advance (but no later than 2 hours in advance) of the first dispatch hour of the capacity auction dispatch test activation. Resources will receive a schedule in pre-dispatch and real-time, regardless of the demand response energy bid price submitted.

~~If an HDR resource with being tested demonstrates a curtailment of electricity withdrawal from the IESO-controlled grid equal to their demand response energy bid within a 15% dead-band for every dispatch interval (or every dispatch hour for residential HDRs) for the duration of the test (up to 4 hours), the test will be deemed a pass.~~

~~In advance of the capacity obligation auction dispatch test, if the capacity market participant is aware of a non-performance event that will make the HDR resource being tested unable to comply with the capacity auction dispatch test activation on the dispatch day, it is the responsibility of the capacity market participant to manage its non-performance as described in "Market Manual 7.3: Outage Management". If the non-performance event indicates that the entirety of the HDR resource's demand response capacity energy bid is unavailable, subsequent the capacity auction dispatch test activations will will not be deemed a failure and may be rescheduled by the IESO following the completion of the non-performance event.~~

~~An HDR resource's capacity auction dispatch test activation is considered valid, unless:~~

- ~~The capacity market participant provides advanced notice to the IESO of a non-performance event that would reduce the its demand response capacity of the HDR resource energy bids to 0 MW,~~
- ~~The IESO did not send either advisory, a standby, or activation notifications in advance of the test activation as per the timelines specified above, or~~
- ~~The IESO cancels the test prior to the start of the first dispatch hour of the test activation. The IESO will appropriately inform capacity market participants with HDR resources about the test cancellation.~~

~~The IESO may determine that a test activation for an HDR resource is not required if the IESO is able to verify that the HDR resource delivered an amount equal to its capacity obligation and satisfied the performance parameters defined below, during a previous activation within the same obligation period.~~

~~The IESO may schedule test activation for HDR resources regardless of whether the above conditions are met, if there is evidence that the resource is not able to deliver demand response capacity at any time during the obligation period.~~

~~A second test within an obligation period will not be required if the HDR resource delivers its capacity obligation through a non-test-based or test-based activation during that obligation period.~~

~~Failure of an HDR resource to perform successful test activation may result in one or more of the following:~~

- ~~• Non-performance charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements,”~~
- ~~• A subsequent test activation to be scheduled by the IESO,~~
- ~~• Revocation of reduced test duration, where applicable, and/or~~
- ~~• A compliance investigation to be performed by the IESO.~~

Performance Parameters:

Performance of an HDR resource means the ~~capacity obligation~~ demand response energy bid for the HDR resource is delivered for each hour of the activation period within a 15% dead-band (e.g. at least 85% of the ~~capacity obligation~~ demand response energy bid must be delivered).

Performance will be assessed using the following parameters:

- The load reduction, up to a maximum of 115% of an HDR resource’s energy bid quantity, will be considered per ~~5~~ five-minute dispatch interval

The load reduction across each ~~5~~ five-minute dispatch interval will be summed for each activation hour (all 12 intervals) to determine the hourly load reduction

Reduction of Test Length of HDR Resources

~~An HDR resource that has delivered its capacity obligation during a four-hour activation (non-test-based⁸ or test-based) will be subsequently tested for a one-hour duration. Tests following unsuccessful four-hour activations shall continue as four-hour activations.~~

~~The IESO may revert the test duration for an HDR resource from one hour back to four hours upon provision of advance notice, identifying which conditions were not satisfied.~~

~~An HDR resource’s one-hour test duration will be maintained provided:~~

- ~~a) The HDR resource has demonstrated delivery of bid quantity in all activations (non-test-based or test-based) since qualifying for reduced testing, where the bid quantity must be equal to its capacity obligation in at least one of two most recent activations (non-test-based or test-based)~~

⁸ Non-test-based activation can refer to an in-market or emergency activation

- Delivery of bid quantity means the load reduction for each hour of the activation period, within a 15% dead band compared to its demand response bid quantity⁹ (e.g. at least 85% of the bid quantity must be delivered), and
 - Has performed within the Performance Parameters stated above
- b) The *HDR* resource has not increased its *capacity obligation* by more than 5 MW from the last successful four-hour activation (non-test-based or test-based).

Testing of Capacity Import Resources

The *IESO* may direct *capacity import resources* to perform up to two activation tests per *obligation period* for each *capacity auction resource* to verify that the *auction capacities* are deliverable. Tests will be scheduled to occur during the *availability window* of the *dispatch day*.

The tests are conducted as follows:

- Up to 2 hours in advance of any test, applicable *capacity import resources* will receive a constraint and a schedule should appear in PD-1. Tests may be scheduled for a duration of up to 4 hours.
- If a *capacity import resource* being tested is successfully scheduled in *pre-dispatch* and not curtailed and subject to a capacity charge as per “Market Manual 4.3: Real-Time Scheduling of the Physical Markets”, the test will be deemed a success.
- Failure of the test will result in the applicable charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements.”

If a *capacity import resource* is unable to comply with the test activation of the *auction capacity* on the *dispatch day*, it is the responsibility of the *capacity market participant* to notify the *IESO*, and update the *energy offers* in accordance with “Market Manual 4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets”. A subsequent test activation will be rescheduled by the *IESO* following the completion of the *outage*.

The *IESO* may determine a test activation for a *capacity import resource* is not required if all the following criteria are met. The:

- *capacity import resource* receives and follows sufficient *dispatch instructions* in the *energy market*,
- *dispatches* are within the *availability window*, and
- *capacity import resource* demonstrates that its *capacity obligation* has been met.

~~Failure of a *capacity import resource* to perform a successful test activation may result in one or more of the following:~~

- ~~● Non-performance charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements,”~~
- ~~● A subsequent test activation to be scheduled by the *IESO*, or~~
- ~~● A compliance investigation to be performed by the *IESO*.~~

⁹ Bid quantity means a statement of the quantity in the day-ahead commitment process and the *real-time energy market*, greater than 1 MW, entered by a *capacity market participant* for an *HDR resource* to fulfill a *capacity obligation* availability requirement.

5.4 Measurement Data Audit [for Virtual HDR Resources](#)

The IESO conducts audits to assess and verify the completeness and accuracy of submitted demand response measurement data, and supporting information and documents including but not limited to the Local Distribution Company billing statements, and Single Line Diagrams. The audit procedures and processes described herein are specific to the Virtual C&I HDR resources.

Capacity Market Participant's Responsibilities

This section covers the *capacity market participants'* responsibilities associated with performing measurement data audits.

The *capacity market participant* is responsible for:

- Providing the IESO auditor with access to the information required;
- Submitting information and evidence requested; and
- Payment of non-performance charges, as outlined in Section 6, if the audit requirements are not met

Virtual C&I HDR Resource Audit

Virtual C&I HDR resource audit will be conducted by evaluating each *demand response contributor* that is mapped to the selected Virtual C&I HDR resource. The IESO will establish audit results by conducting a review of the supporting information provided at the time of registration and documentations provided during the audit including: Local Distribution Company (LDC) billing statements and individual *demand response contributor* measurement data for the respective virtual C&I HDR resource. All processes related to the virtual C&I HDR resource audit will be managed through the Online IESO.

Audit Scheduling and Submission of Supporting Documents

The Virtual C&I HDR Resource audit can be categorized as follows:

- Full Audit
 - *Capacity market participants* are required to submit all required documents for all *demand response contributors*
- Partial Audit
 - A spot check to evaluate and compare meter data interval(s) for one or more *demand response contributors* against their respective LDC interval meter data; or
 - A manual selection of a set of *demand response contributors* from a portfolio. In case of a manual selection, *capacity market participant* is required to submit all required documents for the selected *demand response contributors*.

The default deadline is set to one calendar month from the date of issuance for the submission of all required supporting documentation:

Local Distribution Company Billing Statement

The *capacity market participants* are required to provide to the IESO a copy of Local Distribution Company (LDC) billing statement for all the *demand response contributors* registered under the *capacity market participant's* portfolio. This information will be used by the IESO auditor to verify:

- The LDC account number with the information found in the *meter registry*.
- The total energy presented on the LDC statement against the meter data file submitted for the individual *demand response contributor*.

Measurement Data

The *capacity market participants* are required to provide the IESO with individual *demand response contributor meter* data as explained in [Section 5.3.2](#). The IESO auditor will assess the following criteria at the time of audit:

- The participant is available to curtail its load on *business days* and hours during an *obligation period* as defined in this manual.
- The participant has submitted measurement data¹⁰ for the audit month and an additional two months of baseline.
- Actual measurement data¹¹ meets the criteria defined in [Section 5.4.4](#) of the document.

Procedure to Conduct a Virtual C&I HDR Audit

The Virtual C&I HDR audit consists of two steps:

1. **Step 1** of the audit reconciles actual *demand response contributor* measurement data to the *demand response contributors* LDC billing statement
2. **Step 2**¹² of the audit reconciles the sum of the *demand response contributor's* actual measurement data to the submitted measurement data (this is the measurement data provided by the *capacity market participant* during activation months in accordance with the Demand Response Measurement Data Submission Timelines).

Mechanism for Step 1 of the Audit Process

To determine the error in Step 1 of the audit process; the sum total of the actual measurement data file for a single contributor is compared against the total monthly consumption indicated in the LDC billing statement for that contributor. The difference between the two values shall be within 1% of the consumption indicated in the LDC Statement.

Step 1 of the audit process consists of two individual reconciliation checks

1. Comparing the total kWh (energy) for a given month – Area under the curve
2. Comparing the highest kW (Power) value – Peak Demand

¹⁰ Submitted measurement data refers to the monthly Data submissions for the DR Resource in accordance with the Demand Response Submission Timelines.

¹¹ Actual contributors' measurement data refers to the individually submitted Contributor Data through the DR Audit task in Online IESO.

¹² If a partial audit is conducted, the actual measurement data will only be assessed using Step 1 of the audit process.

These reconciliation checks verify the contributor's data against the total monthly consumption and the peak demand indicated on the LDC statement. However, these reconciliation checks do not provide adequate assurance that the data will reconcile on an interval by interval basis. As such, the IESO at its discretion, may request the *capacity market participant* to provide 5 min **LDC interval data** with a declaration stating that the data has been collected from the LDC. This data will then be compared against the data provided by the *capacity market participant* as part of the audit request. An audit can be deemed as "Complete with Observations" if the intervals from the submitted measurement data are outside the +/-1% threshold when compared to intervals from the LDC verified 5 min interval meter data.

Mechanism for Step 2 of the Audit Process

IESO uses **Absolute Error methodology** to determine the error in Step 2 of the audit process. The methodology is described below:

1. At the time of the audit of a resource, the aggregator is required to submit actual meter data for each contributor that makes up that resource.
2. The actual data is then compared to the submitted measurement data on a 5 min interval basis.
3. An absolute difference between the actual measurement data and submitted measurement data is taken.
4. Sum of the absolute difference is compared against the sum of the submitted measurement data.
5. This sum of the absolute difference should be within 1% of the summed submitted measurement data.

Audit Review and Remedial Actions

The IESO will review supporting documents submitted by the *capacity market participant* for completeness and accuracy. If the review produces any findings, the *capacity market participant* shall be required to submit remedial evidence within the prescribed period as per the audit outcome. If findings are not resolved after one resubmission, the IESO shall close the audit with observations and determine a course of action in order to enforce compliance.

Closure of Audit

Once the review of the submitted evidence is complete, the IESO will disclose the audit results to the *capacity market participant* and close the audit as follows:

1. Virtual C&I *HDR Resource* audit is considered 'Complete' when
 - a. Contributors actual measurement data reconciles with associated LDC billing statement (tolerance of +/- 1%) and
 - b. Sum of actual measurement data reconciles with submitted measurement data (tolerance of +/- 1%)
2. A Virtual C&I *HDR Resource* audit is 'Closed with Observations' when it is concluded that actual measurement data and supporting documentation differs from submitted measurement data and supporting documentation (Ch. 9 s.4.7J.4) i.e. that the audit reveals that data was outside the prescribed threshold in either Step 1 or Step 2 of the audit process.

– End of Section –

6. Settlements

Capacity market participants with capacity obligations will be settled, for both payments and non-performance charges, using the *physical markets settlement process* as detailed in “Market Manual 5.5: Physical Markets Settlement Statements.” Details on how the costs will be recovered are also provided in Market Manual 5.5.

Capacity market participants will be paid availability payments, [and may be eligible for dispatch test activation/emergency operating state activation payments and availability charge true-up payments](#), as detailed in Market Manual 5.5. Applicable non-performance charges will apply when *energy market participation requirements* outlined in this manual are not met.

In general, non-performance charges occur for the following situations:

- i. Availability requirements are not met (i.e. availability charge);
- ii. Measurement data submission was not accurate, timely or complete (i.e. administration charge);
- iii. *Dispatch instructions* were not followed (i.e. *dispatch* charge); and
- iv. Failing a [capacity auction capacity test activation](#) (i.e. capacity charge).

Non-performance charges will be calculated and settled as detailed in Market Manual 5.5.

6.1 Non-Performance Factors

The non-performance factors referenced in Market Manual 5.5: [Physical Markets Settlement Statements](#) will use the factors listed in the table below for settling each *capacity obligation* for the month that is being settled.¹³ [Months with a non-performance factor of 2.0 are considered months experiencing peak system conditions \(peak months\).](#)

Table 6-1: Non-Performance Factors

Month	Factor
January	2.0
February	2.0
March	1.5
April	1.0
May	1.0
June	1.5
July	2.0
August	2.0

¹³ [Some charge types impose additional factors, incremental to the NPFs listed, which are detailed in Market Manual 5.5: Physical Markets Settlement Statements.](#)

Month	Factor
September	2.0
October	1.0
November	1.0
December	1.5

– End of Section –

7. Buy-out Process

Successful *capacity auction participants* and *capacity market participants* have the option to [request a full or partial](#) buy-out of their *capacity obligations* at any time. ~~A full or partial buy-out may be requested anytime~~ during the *forward period* or ~~the~~ *obligation period*. The buy-out will be valid from the effective date of the buy-out request until the end of the associated *obligation period*. The effective date will be no sooner than the two *business days* following the date that the *IESO* receives the request to buy-out. Upon *IESO's* acceptance of a buy-out request, a buy-out charge will apply and is settled using the *physical markets settlement process* for the next available month-end *preliminary settlement statement*. Participants may refer to “Market Manual 5.5: Physical Markets Settlement Statements” for details on how the buy-out charge is calculated prior to initiating the buy-out process.

In order to initiate a buy-out, a written request must be submitted to the *IESO* by the registered *capacity auction* contact via email to: customer.relations@ieso.ca.

The email must contain the following information for each *capacity obligation* the participant requests to buy-out from:

- Capacity obligation ID;
- Effective date of the buy-out request¹⁴;
- Buy-out *obligation period*: Specify the *obligation period* the buy-out is being requested for;
- Buy-out zone;
- *Capacity auction resource*; and
- Buy-out capacity: Specify the capacity of the buy-out request in MW-, [to one decimal place](#). In the case of a partial buy-out request, the remaining *capacity obligation* must be greater than or equal to 1 MW. In the case of a full buy-out request, the remaining *capacity obligation* must be 0 MW.

The *IESO* will [process/review](#) the buy-out request within [seventwo](#) *business days*. At the end of this review period, the *IESO* will either:

a. ~~Approve the buy-out request: The IESO will notify the participant of the applicable buy-out charge.~~

~~b-a. If;~~ if the participant has requested ~~for~~ a partial buy-out, the *IESO* will notify it of the revised *capacity obligation*.

[OR](#)

b. [Reject the buy-out request and provide a reason for rejection.](#)

[For greater clarity, a participant should not begin adjusting their energy market bids in advance of receiving the IESO's approval and confirmation of the effective date of the buy-out request. Otherwise,](#)

¹⁴ For a [capacity auction participant or capacity market participant](#) that has not registered a resource in the *energy market* for a *capacity obligation*, the effective date of the buy-out request must be specified as the first day of the associated *obligation period*. [If a buy-out would be effective during an obligation period, the effective date of the buy-out request cannot be sooner than the two business days following the date that the IESO receives the buy-out request.](#)

the participant may be subject to non-performance charges as specified in Market Manual 5.5: Physical Market Settlements.

The IESO will then process the buy-out request within five *business days* and notify the participant of the buy-out charge, and:

- If the participant has requested a full buy-out of all its *capacity obligations*, the IESO will refund its pre-auction deposit amount, at the participant's request, within ten *business days* after the IESO has received payment for the buy-out charge.
- If the *capacity prudential support obligation* is revised downward due to a buy-out, the IESO will refund the difference, at the participant's request, after the IESO has received the payment for the buy-out charge. The revised *capacity prudential support obligation* will be based on the revised *capacity obligation*.

OR

~~c. Reject the buy-out request: The IESO will provide a reason for rejection.~~

– End of Section –

8. Capacity Obligation Transfer

[\(Market Rules: Ch. 7, S. 18.9\)](#)

Capacity auction participants and *capacity market participants* may transfer their *capacity obligations* fully or partially. Once approved by the *IESO*, the *capacity obligation* transfer will be effective as of the first day of the associated *obligation period* and will be valid for the entirety of that *obligation period*.

A *capacity transferor* may request a full or partial *capacity obligation* transfer during the *forward period*, provided such request is made no later than 14 *business days* prior to the start of the *obligation period*.

In order to initiate a *capacity obligation* transfer, a request must be submitted to the *IESO* using Online IESO by the *capacity transferor*. A separate request must be submitted for each *capacity obligation* and contain the following information:

- *Capacity obligation* ID and associated *capacity auction resource* belonging to the *capacity transferor*;
- The name of the *capacity transferee*;
- The capacity (in MW) of the transfer request. For both transferee and transferor, the respective resulting *capacity obligations* cannot be between 0 and 1 MW (but, for greater certainty, can be 0 MW and can be equal to or greater than 1 MW); and
- The *obligation period* for which the transfer is being requested;

The request will not be considered by the *IESO* until the *IESO* receives, via Online IESO, confirmation from the *capacity transferee* that it accepts the new/additional *capacity obligation* (only when the *capacity transferor* and the *capacity transferee* are not the same *capacity auction participant*) and the name of the *capacity auction resource* that will accept the *capacity obligation*. If a *capacity auction participant* or a *capacity market participant* intends to submit multiple partial transfer requests in relation to a single *capacity obligation*, only one transfer request may be submitted at a time. The first request submitted must be approved by the *IESO* before the second request can be submitted.

The *IESO* will assess each *capacity obligation* transfer request in the order received by the *IESO* and determine whether the *capacity obligation* transfer request meets the criteria stipulated in Chapter 7, Section 18.9 of the *market rules*. These criteria include satisfying any revised *capacity prudential support obligation* or *capacity auction deposit*, as applicable:

- A revised *capacity prudential support obligation* is required if the *capacity obligation* to be transferred will be satisfied by the *capacity transferee's* existing resource that is registered to meet a *capacity obligation* for the same *obligation period* and for which sufficient *capacity prudential support*, prior to the transfer, has been posted, otherwise;
- A revised *capacity auction deposit* is required.

In either case, the *capacity transferee* must satisfy any revised *capacity prudential support obligation* (as specified in Section 1.3.8 of Market Manual 5.4), or the revised *capacity auction deposit* (as specified in Section 3.4), within five *business days* of receiving notification from the *IESO* of such requirement, or such longer period as agreed upon between the *IESO* and the *capacity transferee*. The *IESO* will notify the *capacity transferee* of any additional *capacity auction deposit* or *capacity prudential support obligation*, as required.

After all criteria are assessed, the IESO will approve or reject the *capacity obligation* transfer. If rejected, the IESO will provide a reason for rejection to both the *capacity transferor* and the *capacity transferee*.

If approved, the IESO will notify the *capacity transferor* and the *capacity transferee*. If the *capacity transferor* has requested a partial transfer, the IESO will notify the *capacity transferor* of the revised *capacity obligation*.

A *capacity transferee* who acquires a *capacity obligation* as a result of a transfer from a different zone will be settled based upon the *capacity auction clearing price* received when that first originally cleared the *capacity auction* (i.e. the original zone). The revised *capacity auction clearing price* will be included in the participant's confidential post-auction [auction](#) report. For example, a *capacity auction participant* receives a *capacity obligation* of 25MW in a *capacity auction* at a *capacity auction clearing price* of \$100/MW-day. If the *capacity auction participant* accepts a *capacity obligation* transfer for an additional *capacity auction capacity* of 50MW for the same *capacity auction resource* via a transfer from another zone where the *capacity auction clearing price* is \$40/MW-day, the revised *capacity obligation* for the *capacity auction resource* will be 75MW. Its revised (blended) *capacity auction clearing price* will be \$60/MW-day, calculated from $[(25 \times \$100) + (50 \times \$40)] \div 75 = \$60/\text{MW-day}$.

Upon completion of a successful transfer, the *capacity transferor* may request to reduce its *capacity auction deposit*, if applicable, as specified in Section 3.4.

– End of Section –

Appendix D: Performance Adjustment Factor Application by Year

<u>Auction Year</u>	<u>December 2022</u>	<u>December 2023</u>	<u>December 2024</u>
<u>Inputs for Summer PAF Calculation</u>	<u>N/A</u>	<u>N/A</u>	<u>Resource specific capacity test activation data from summer of auction year 2022 (Summer obligation period of May – October 2023)</u>
<u>Inputs for Winter PAF Calculation</u>	<u>N/A</u>	<u>N/A</u>	<u>Resource specific capacity test activation data from winter of auction year 2022 (Winter obligation period of November 2023 to April 2024)</u>
<u>Performance Outputs</u>	<u>Summer & Winter PAF - to be calculated for all resources and used for qualification in December 2024 Auction</u>	<u>Summer & Winter PAF - to be calculated for all resources and used for qualification in December 2025 Auction</u>	<u>Summer & Winter PAF - to be calculated for all resources and used for qualification in December 2026 Auction</u>

Appendix E: Attestation for Capacity Auction Eligible Generation Resource

Italicized terms found within this attestation have the meaning ascribed to them in Chapter 11 of the *market rules*, which may be found at: <http://www.ieso.ca/Sector-Participants/Market-Operations/Market-Rules-And-Manuals-Library>.

By participating in the *capacity auction* through use of a *generation facility* and by clicking “SUBMIT” below, you attest to the following:

1. The resource(s) which the *capacity auction participant* is/are submitting to the capacity qualification process is/are a *non-committed resource* associated with a *generation facility*;
2. The resource(s) meet(s) the requirements of a *capacity auction eligible generation resource*, which is defined as follows:

capacity auction eligible generation resource means a *non-committed resource* that is associated with a *generation facility*, which is also a *connected facility* at the commencement of the capacity qualification process for a given *capacity auction*, and which is registered as dispatchable with the IESO prior to the *obligation period* in accordance with the timelines specified in the applicable *market manual*.

[Note: *Capacity auction eligible generation resources* are not required to be registered as dispatchable with the IESO at the time this attestation is made.]

3. Such resource(s) is/are a *connected facility*;
4. Such resource(s) will be registered as dispatchable prior to the *obligation period* in accordance with the timelines specified in the applicable *market manual*; and
5. You have authority to make this attestation on behalf of the participating *capacity auction participant*.

Appendix F: Attestation for Capacity Auction Eligible Storage Resource

Italicized terms found within this attestation have the meaning ascribed to them in Chapter 11 of the *market rules*, which may be found at: <http://www.ieso.ca/Sector-Participants/Market-Operations/Market-Rules-And-Manuals-Library>.

By participating in the *capacity auction* through use of an *electricity storage facility* and by clicking “SUBMIT” below, you attest to the following:

1. The resource(s) which the *capacity auction participant* is/are submitting into the capacity qualification process is/are a *non-committed resource* associated with an *electricity storage facility*;
2. The resource(s) meets the requirements of a *capacity auction eligible storage resource*, which is defined as follows:

capacity auction eligible storage resource means a *non-committed resource* associated with an *electricity storage facility*, which is also a *connected facility* at the commencement of the capacity qualification process for a given *capacity auction*, and which is registered as dispatchable with the *IESO* prior to the *obligation period* in accordance with the timelines specified in the applicable *market manual*;

[Note: *Capacity auction eligible storage resources* are not required to be registered as dispatchable with the *IESO* at the time this attestation is made.]
3. Such resource(s) is/are a *connected facility*;
4. Such resource(s) will be registered as dispatchable prior to the *obligation period* in accordance with the timelines specified in the applicable *market manual*; and
5. You have authority to make this attestation on behalf of the participating *capacity auction participant*.

Appendix G: Attestation for System-backed Capacity Auction Eligible Import Resource

Italicized terms found within this attestation have the meaning ascribed to them in Chapter 11 of the *market rules*, which may be found at: <http://www.ieso.ca/Sector-Participants/Market-Operations/Market-Rules-And-Manuals-Library>.

By participating in the *capacity auction* through use of a *boundary entity* and by clicking “SUBMIT” below, you attest to the following:

1. Such agreements or arrangements have been made, in connection with your participating resource(s) as are necessary in order to ensure that:
 - capacity imports related to a *capacity obligation* will be offered into Ontario’s *energy market* with firm 7F transmission service; and
 - the planning authority(ies) responsible for adequacy assessment(s) for the host jurisdiction will remove any capacity (MW) related to a *capacity obligation* from its adequacy assessments.

2. Your participating resource(s) meets the definition of *system-backed capacity auction eligible import resource*. That definition reads as follows:

System-backed capacity auction eligible import resource means a *capacity auction resource* associated with a *boundary entity* that is available to qualify capacity that a neighbouring *control area operator* is willing to allocate to Ontario, if a *capacity obligation* is secured, for the duration of the applicable *obligation period*, which capacity would be deemed to be supplied from the entire system of the neighbouring *control area*. The allocated capacity must not otherwise be - in whole or in part - contracted to or otherwise obligated to be provided to the *IESO*, the *OEFC*, or a *neighbouring control area operator*, or obligated as a resource backed capacity export to another jurisdiction during the entire duration of a given *obligation period*;

3. You have authority to make this attestation on behalf of the participating *capacity auction participant*.

Appendix H: Attestation for Generator-backed Capacity Auction Eligible Import Resource

Italicized terms found within this attestation have the meaning ascribed to them in Chapter 11 of the *market rules*, which may be found at: <http://www.ieso.ca/Sector-Participants/Market-Operations/Market-Rules-And-Manuals-Library>.

By participating in the *capacity auction* through use of a *boundary entity* and by clicking “SUBMIT” below, you attest to the following:

1. The *capacity auction participant* is the registered owner as registered in the host *control area*, or legally owns, holds rights equivalent to ownership, or has an exclusive legal relationship with the legal owner to utilize the facility(ies) or specific equipment within a facility in regards to its own participation in the *capacity auction* and to satisfy a potential *capacity obligation*;

2. The resource(s) which the *capacity auction participant* is/are submitting to the capacity qualification process meets the requirements of a *generator-backed capacity auction eligible import resource* and a *generator-backed import contributor*, which are defined as follows:

generator-backed capacity auction eligible import resource means one or more *generator-backed import contributors*. No portion of the capacity that is being offered into the *IESO capacity auction* may be *over committed capacity*;

generator-backed import contributor means an existing in-service *generation facility* or *storage facility* associated with a *generator-backed capacity auction eligible import resource*, and which is located in a neighbouring *control area* that has an agreement with the *IESO* to allow for the trade of capacity, is able to qualify capacity through the capacity qualification process in accordance with the applicable *market manual*, has been in operation for at least one year prior to the *capacity auction*, is a resource type that is currently enabled to participate in the *IESO's capacity auction*, and is able to transmit energy from the *generation facility* or *storage facility* to the Ontario border;

3. You have authority to make this attestation on behalf of the participating *capacity auction participant*.

References

Document ID & Link	Document Title
MDP_RUL_0002	Market Rules for the Ontario Electricity Market
IMP_GDE_0088	Market Manual 1.3: Identity Management Operations Guide
PRO-408	Market Manual 1.5: Market Registration Procedures
MDP_PRO_0027	Market Manual 4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets
IMP_PRO_0034	Market Manual 4.3: Real-Time Scheduling of the Physical Markets
MDP_PRO_0045	Market Manual 5.4: Prudential Support
MDP_PRO_0033	Market Manual 5.5: Physical Markets Settlements Statements
IMP_PRO_0035	Market Manual 7.3: Outage Management
IESO_MAN_0077	Market Manual 9.2: Submitting Operational and Market Data for the DACP

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