



MANUAL

Market Manual 12.0: Capacity Auctions

Issue 14.0

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

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Reference (Section and Paragraph)	Description of Change
Section 2.6	Addition of zonal constraint for groups of electrical zones
Section 3.3	Addition of enrollment requirements for new resource type, generator-backed capacity import resource
Section 4.2	Addition of zonal constraints for groups of electrical zones as part of the auction clearing mechanics
Sections 5.1, 5.2	Addition of post-auction authorization and registration requirements for new resource type, generator-backed capacity import resource
Section 5.3.3	Addition of test activation requirements for new resource type, generator-backed capacity import resource Clarity added to test procedure for all resource types
Section 7	Wording amended to clarify the timelines for review and processing of a buy-out request
Appendix C	New appendix; generator-backed import resource data submission as part of test activation
Appendix D, E, F, G	New appendices; attestations submitted as part of capacity enrollment process
Throughout	Defined terms are italicized, general clean-up to remove language duplicated from the market rules, and addition of corresponding market rule references below section headers.

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” 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 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 *capacity auction offers* by *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,
- 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).

This *market manual* refers 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 *auction capacity* into the *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>). 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* 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* 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 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:

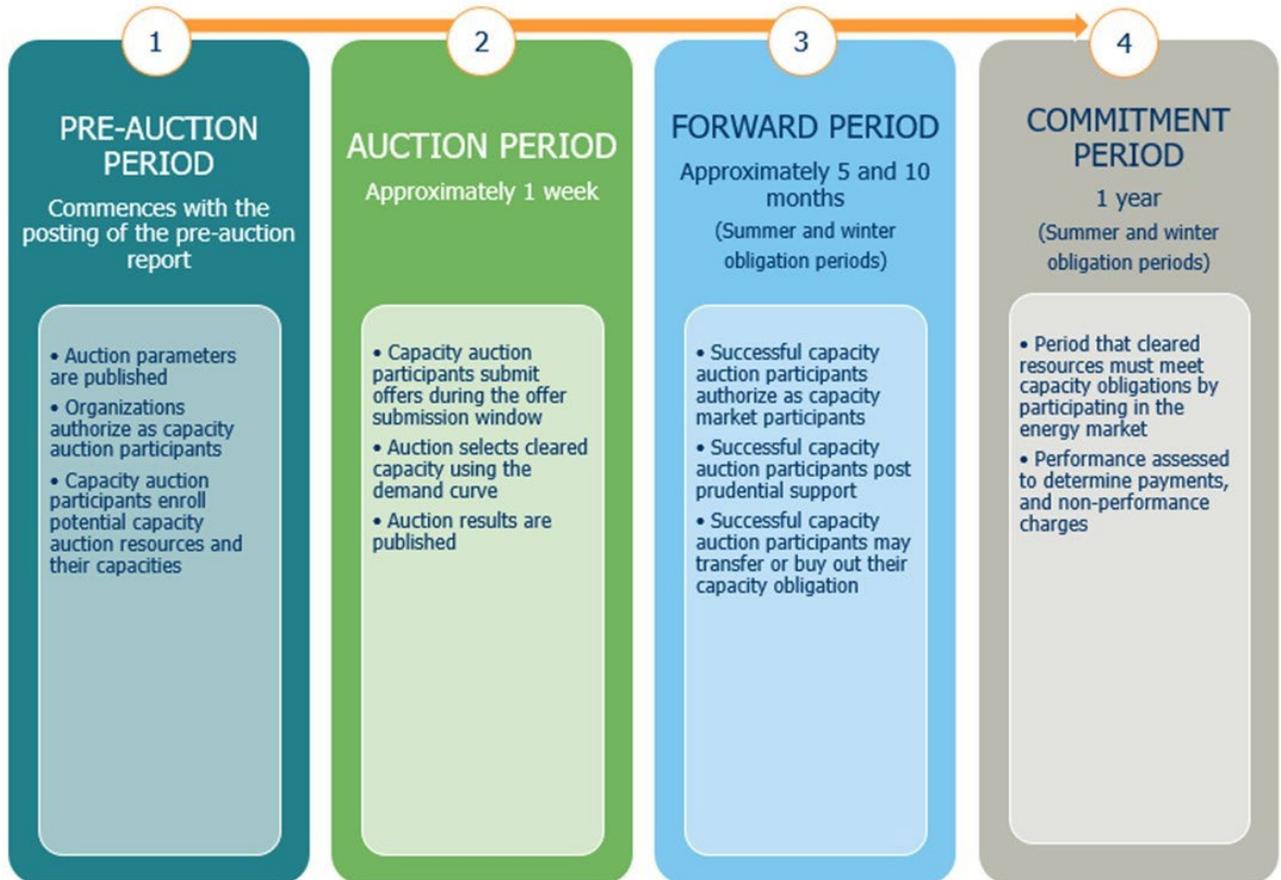


Figure 2-1: Capacity Auction Process

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 for the *capacity auction*.
- *Market participants* intending to participate in the *capacity auction* must complete their authorization as *capacity auction participant* at least 40 *business days* in advance of the *capacity auction*, or within such other period as set by the *IESO* in its sole and absolute discretion¹.
- *Market participants* intending to participate in the *capacity auction* are required to complete the *capacity* enrollment process and afterwards 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 *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 *offer* submission window.
- The *IESO* will process all submitted *capacity auction offers*, determine *capacity auction clearing prices* and quantities, and prepare and *publish* both the public and confidential post-auction reports by 16:00 EST, four *business days* following the day on which the offer submission window closes.

¹ 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.

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 beginning three *business days* following the IESO publishing the auction results, 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*.

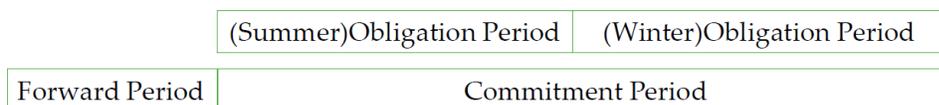


Figure 2-2: Periods of time related to *capacity auctions*

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).

All *capacity market participants* with a *capacity obligation* 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*.

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*
- *Capacity auction reference price*
- A maximum and minimum *capacity auction clearing price*; 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.

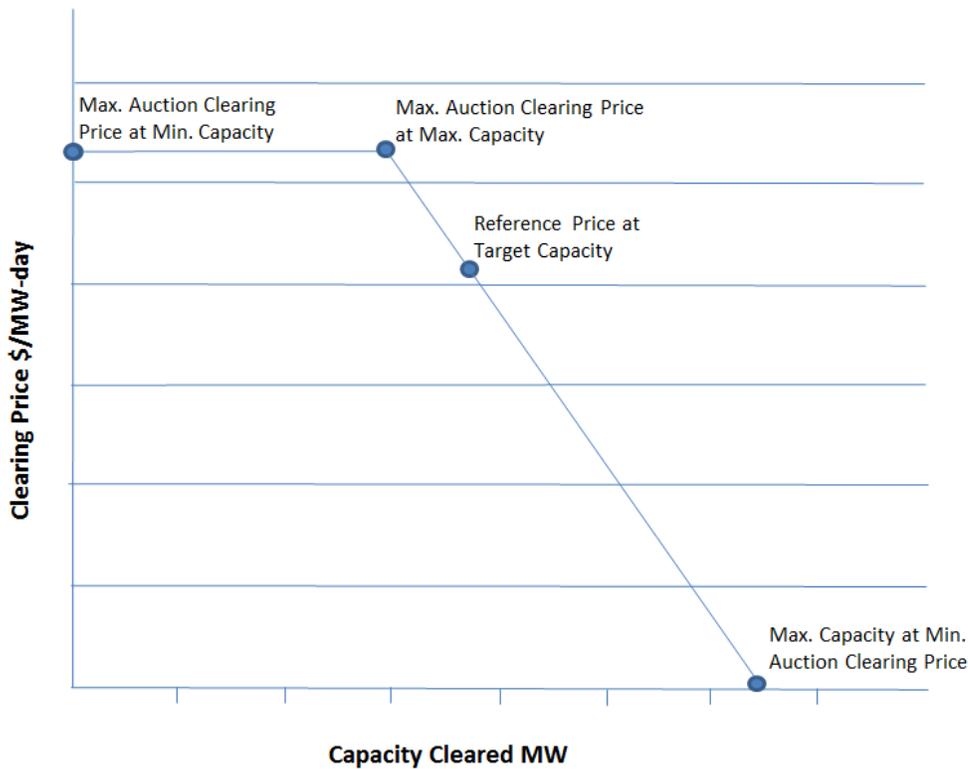


Figure 2-3: Downward Sloping Demand Curve

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.

2.5.2 Capacity Auction Reference Price

The *capacity auction reference price* for each *obligation period* shall be *published* by the IESO in the pre-auction report.

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:

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

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.

2.6 Zonal Constraints

(*market rules*: Ch. 7, s. 18.5.3)

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 transmission interface. These include:

- minimum amount of *auction capacity* to be acquired; and
- 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*. The IESO shall *publish capacity auction zonal constraints* in the pre-auction report.

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 constraints that can be cleared in the *capacity auction*. These 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 the combination of *system-backed capacity import resources* and *generator-backed capacity import resources*. When this constraint is binding 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 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.

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](#). As such, there will be no price separation for either *system-backed capacity import resources* or *generator-backed capacity import resources*, and the resources located within Ontario's electrical zone the interface borders. The IESO shall *publish capacity import constraints* in the pre-auction report.

– End of Section –

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).

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 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](#) below. There are also participant authorization, enrollment, and *capacity auction deposit* requirements for *market participants* who wish to participate in the *capacity auction*, as further explained below.

3.1 Pre-Auction Reporting Obligations

(*market rules*: Ch. 7, ss. 18.5.2, 18.5.3, 18.5.4, 18.5.5, and 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*:

- *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*
- *Capacity auction zonal constraints* for each electrical zone and groups of zones as explained in [Section 2.6](#) of this manual
- Capacity import constraints as explained in Section 2.7 of this manual

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

- the dates for *capacity auction participants* to enroll potential *capacity auction resources* and the amount of *auction capacity* that they are willing to provide for each 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 auction* 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 Authorization Process

(*market rules*: Ch.2, ss. 2.1.1.11 and 2.1.1.12, Ch. 7, ss. 18.2.1.1, 19.8 and 19.9A)

All prospective participants who wish to participate in the *capacity auction* are required to authorize as *capacity auction participants* 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 Enrollment

(*market rules*: Ch. 7, ss. 18.2 and 18.2A)

Capacity auction participants who wish to participate in a given *capacity auction* shall identify to the *IESO* the eligible *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 *capacity auction resource*. This submitted quantity shall be used to set the *capacity auction participant's enrolled capacity* for that auction. The *enrolled 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 enrollment submission deadline via the pre-auction report.

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

A *capacity auction participant* may revise or withdraw a capacity enrollment submission up until the enrollment submission window closes per the timelines detailed in the pre-auction report. Both actions are completed in Online IESO.

Prior to the deadline specified in the pre-auction report, *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 capacity enrollment process:

- The amount of potential *auction capacity*, not less than 1 MW per *capacity auction resource*, that they could reliably provide, and may be willing to offer, in each *obligation period*,
 - For *generator-backed capacity auction eligible import resources*, the amount of potential *auction capacity* must be provided for each *generator-backed import contributor*
- 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* that will satisfy a *capacity obligation* during the *commitment period* and for *HDR resources*, the obligation type (e.g. physical or virtual) and *demand response contributor* type (e.g. Residential or Commercial & Industrial). Refer to Section 5.3.2 for details on submitting *demand response contributor* data information in the *forward period* and *obligation period*.
- Confirmation of having submitted the *capacity auction deposit* as determined by the *IESO*, further explained in [Section 3.4](#) of this manual.

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).

Additional information is required for each *capacity auction resource* type, as specified in Table 1-1.

Table 1-1: Additional information required to complete capacity enrollment by capacity auction resource type.

Capacity Auction Resource Type	Additional Information Required
<i>Capacity generation resources</i>	<ul style="list-style-type: none"> The <i>registered facility</i> and associated resource that will satisfy the <i>capacity obligation</i> A signed attestation declaring that the <i>generator</i> that will satisfy the <i>capacity obligation</i> meets the requirements of a <i>capacity auction eligible generation resource</i> as set out in Chapter 11, Definitions of the <i>market rules</i>. This attestation can be found in Appendix D: Attestation for Capacity Auction Eligible Generation Resource.
<i>Capacity storage resources</i>	<ul style="list-style-type: none"> The <i>registered facility</i> and associated resource that will satisfy the <i>capacity obligation</i> A signed attestation declaring that the <i>generator</i> that will satisfy the <i>capacity obligation</i> meets the requirements of a <i>capacity auction eligible storage resource</i> as set out in Chapter 11, Definitions of the <i>market rules</i>. This attestation can be found in Appendix E: Attestation for Capacity Auction Eligible Storage Resource
<i>Capacity dispatchable load resources</i>	<ul style="list-style-type: none"> The <i>registered facility</i> and associated resource that will satisfy the <i>capacity obligation</i> If there is no <i>registered facility</i>, the zonal location of the potential <i>capacity dispatchable load resource</i>. Participants may choose from the ten electrical zones to submit <i>capacity auction offers</i>
<i>System-backed capacity import resources</i>	<ul style="list-style-type: none"> The external interface that will be used to deliver the <i>auction capacity</i> A signed attestation acknowledging that all eligibility requirements have been met, as set out in Chapter 11, Definitions of the <i>market rules</i> and that has taken such actions as are necessary in order to ensure that: <ul style="list-style-type: none"> Capacity imports related to a <i>capacity obligation</i> 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 <i>capacity obligation</i> from its adequacy assessments This attestation can be found in Appendix F: Attestation for System-backed Capacity Auction Eligible Import Resource
<i>Generator-backed capacity import resources</i>	<ul style="list-style-type: none"> The external interface that will be used to deliver the <i>auction capacity</i> A signed attestation acknowledging that all eligibility requirements have been met, as set out in Chapter 11 of the <i>market rules</i>, and that the <i>capacity auction participant</i> is the owner of the potential <i>capacity auction resource</i>. This attestation can be found in Appendix G:

Capacity Auction Resource Type	Additional Information Required
	<p>Attestation for Generator-backed Capacity Auction Eligible Import Resource</p> <ul style="list-style-type: none"> • Proof of deliverability to the Ontario border in one of the following forms: <ul style="list-style-type: none"> • For <i>generator-backed capacity auction eligible import resources</i> located within the New York Independent System Operator (NYISO) <i>control area</i>, proof that the resource holds Capacity Resource Interconnection Service (CRIS) status; • For <i>generator-backed capacity auction eligible import resources</i> located within the Hydro Quebec <i>control area</i>, confirmation of firm transmission service from the transmission operator, or; • For <i>generator-backed capacity auction eligible import resources</i> located within any <i>control area</i>, proof of ownership of a direct transmission line to the Ontario border <p>This proof of deliverability document must be submitted by email to capacity.auction@ieso.ca by the capacity auction contact. In addition to the attached evidence, the email should include the following:</p> <ul style="list-style-type: none"> • Participant Name • Associated resource ID for each <i>generator-backed import contributor</i> in which a deliverability document is attached, and; • Enrollment request ID <p>For each <i>generator-backed import contributor</i>, the following must be submitted:</p> <ul style="list-style-type: none"> • Resource name • Resource ID (i.e. the unique numeric identifier for the <i>generation facility</i> as assigned by an external jurisdiction) <p>For each <i>generator-backed import contributor</i> that is a <i>generation facility</i>, the following also must be submitted:</p> <ul style="list-style-type: none"> • Fuel type • <i>elapsed time to dispatch</i> • <i>minimum loading point</i>
<i>Hourly demand response (HDR) resources</i>	<ul style="list-style-type: none"> • The <i>registered facility</i> and associated resource that will satisfy the <i>capacity obligation</i> • If there is no <i>registered facility</i>, the zonal location of the potential <i>demand response resource</i> and/or <i>demand response contributors</i> for which they are willing to submit offers, the obligation type (physical or virtual) and contributor type (Residential or Commercial & Industrial)

Based on the information provided, the IESO will:

- Verify that the *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 as outlined in Ch.7 of the *market rules*

3.4 Capacity Auction Deposit

(*market rules*: Ch. 7, ss. 18.2, 18.3.1, and 18.4)

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*. The submission of the *capacity auction deposit* is confirmed via Online IESO.

The purpose of this deposit is to establish the creditworthiness of the *capacity auction participant* for auction activities. The *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 capacity* in each *obligation period* of the *capacity auction*.

The formula for calculating a *capacity auction participant's capacity auction deposit* is as follows:

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

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:

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

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*.

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

– End of Section –

4. Auction Mechanics

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

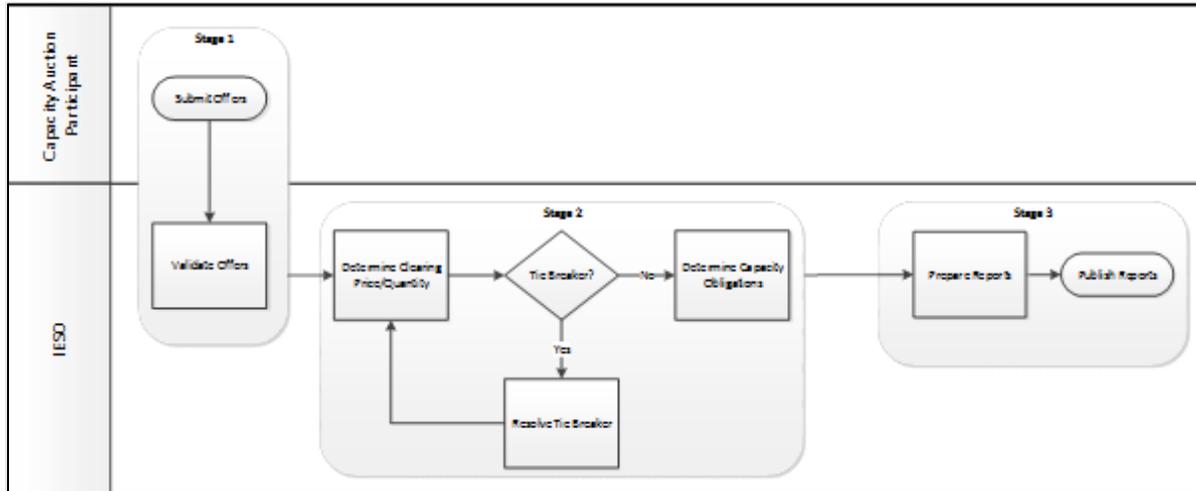


Figure 4-1: Capacity Auction Mechanics Overview

4.1 Stage 1: Offer Submission and Validation

(market rules: Ch. 7, s. 18.6)

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 *capacity auction offers* associated with each potential *capacity auction resource* identified during the capacity enrollment process for any quantity between 1 MW and the *enrolled capacity*, using offer laminations 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* for the potential *capacity auction resource*. The *capacity auction offer* quantity must increase with every new lamination added to an offer set.

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. 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*: Ch. 7, s. 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, per the timelines detailed in [Section 2](#) of this *market manual*.

For each *obligation period*, the *IESO* shall determine the *capacity obligation* for each *capacity auction participant's capacity auction resource*, 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.

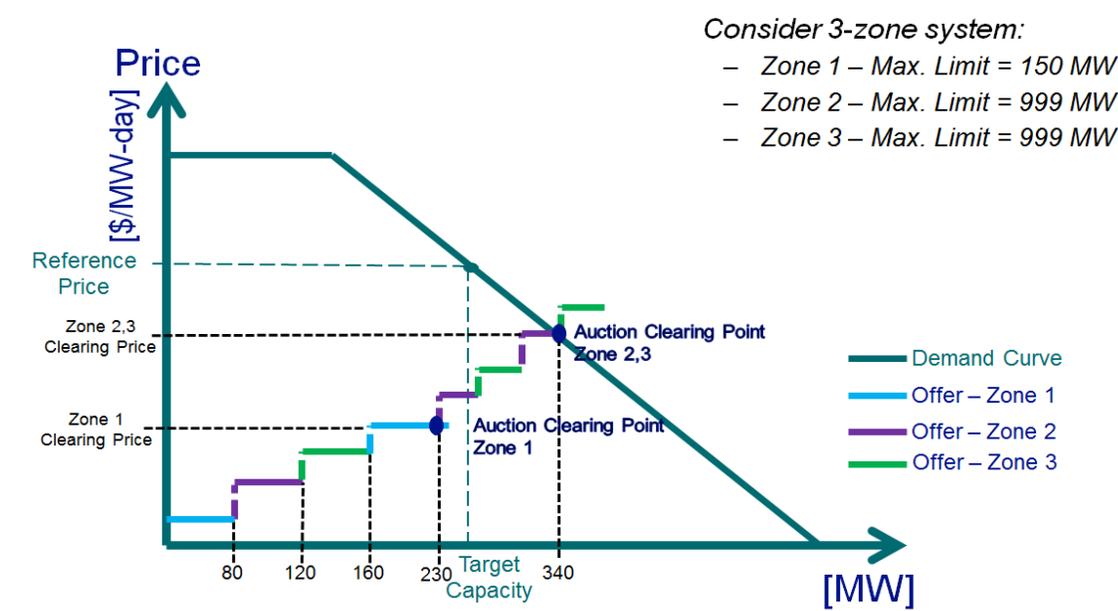


Figure 4-2: Auction Selection Process with Zonal Limits

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 stamp⁴ shall be selected as the successful *capacity auction offer*.

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)*. Resources with a *capacity obligation* will be designated a *capacity auction resource* for the duration of the *commitment period*.

⁴ 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.

4.3 Stage 3: Post-Auction Reporting Obligations

(market rules: Ch. 7, s. 18.8)

Once the auction has been cleared and *auction capacity* quantities and *capacity auction 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*:

- 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* of each *capacity auction participant* by obligation type and zone or external interface, as applicable.

The IESO will also issue confidential post-auction reports to each *capacity auction participant* with the following information for each *capacity auction resource*:

- *capacity obligation(s)*;
- 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

(*market rules*: Ch. 8, s. 18.2.3)

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*. 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*: Ch. 7, ss. 19.2, 19.3, 19.6, 19.8, 19.9A, and 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 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. 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 capacity enrollment in the pre-auction period, 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 capacity enrollment 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 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 (with a maximum of one resource for each contributor type per zone).

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 residential⁵ smart-metered loads that can be classified as:

⁵A 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

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)

purposes of this program the term 'residential', as intended by the *IESO*, excludes 'net-metered' and/or 'unit sub-metered' customers.

- 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.

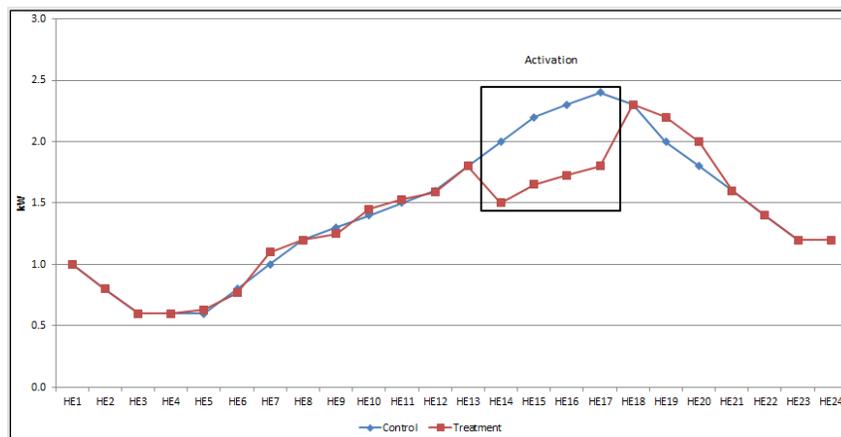


Figure 5-1: Randomized Control Trials (RC) performance evaluation

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](#). *Capacity market participants* with *capacity obligation(s)* associated with *HDR resources* will be compensated for out of market activations, including 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 per the requirements for the applicable resource type set out in “Market Manual 7.3: Outage Management” and must update their *energy offers/energy bids* to reflect the available *auction capacity* of the resource during the *outage*. *Capacity market participants* with *HDR resources* are required to inform the IESO of non-performance events⁶ as set out in Market Manual 7.3: Outage Management.

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*

⁶ 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.

- 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:
 - 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.

- 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: Template for Measurement Data Control Sheet.

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

(*market rules*: Ch. 7, ss. 19.4.11, 19.5.7, 19.7.7, 19.9.6, 19.9B.7, and 19.11.7)

Testing of Capacity Generation Resources

The IESO may direct *capacity generation resources* to perform up to two activation tests per *obligation period* to verify that the resource is capable of satisfying its *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 notified of their test in the following manner:
 - For non-quick start generators, in the day-ahead timeframe and prior to DACP, the resource will have a constraint applied to *generate* to the greater of either their (1) *capacity obligation* or (2) *minimum loading point* for the duration of at least their *minimum generation block run time (MGBRT)*;
 - For quick start generators, up to one hour in advance, the resource will have a constraint applied to *generate* to the greater of either their (1) *capacity obligation* or (2) *minimum loading point* for the duration of at least their *minimum generation block run time (MGBRT)*.
- The *registered market participant* for the *facility* must ensure that *offers* are submitted to at least their *capacity obligation*.
- If a resource being tested demonstrates an injection of electricity into the *IESO-controlled grid* equal to or greater than their *capacity obligation* for every interval for the duration (up to 4 hours) of the test, the test will be deemed a pass.

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 of a *planned outage* or *forced outage* that will make the *capacity generation resource* 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 about its inability to start and complete the test activation, according to the *outage* reporting requirements specified for *generation facilities* as specified in “Market Manual 7.3:

Outage Management” 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”.

The *capacity market participant* with a *capacity generation resource* that is a *non-quick start facility* assumes the risk of failing the test activation if a forced *outage* occurs during the ramp-up period resulting in the *capacity auction resource* being unable to deliver its *offered/bid* MW amount during the scheduled test activation.

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

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

- the *capacity generation resource* receives and follows sufficient *dispatch instructions* in the *energy market*,
- dispatches are within the *availability window*, and
- the dispatches are to at least the amount of their *capacity obligation*

Failure of a *capacity generation 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*.

Testing of Capacity Storage Resources

The *IESO* may direct *capacity storage resources* to perform up to two activation tests per *obligation period* for each *capacity auction resource* to verify that the resource is capable of satisfying its *capacity obligation*. Tests will be scheduled to occur during the *availability window* of the *dispatch day* and will not take place if a real-time economic dispatch has already occurred within that day’s *availability window*.

The tests are conducted as follows:

- Applicable resources will be notified of their test in the following manner:
 - The *capacity auction resource* will have a constraint applied to *generate* to its *capacity obligation* for the duration of the test.
- The *registered market participant* for the *facility* must ensure that *offers* are submitted to at least their *capacity obligation*.
- If a resource being tested demonstrates an injection of electricity into the *IESO-controlled grid* equal to or greater than their *capacity obligation* for every interval for the duration (up to 4 hours) of the test, the test will be deemed a pass.

Failure of the test will result in non-performance charges as specified in “Market Manual 5, Part 5.5: Physical Markets Settlement Statements.”

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 storage resource* 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* about its inability to start and complete the test activation, according to the *outage* reporting requirements specified for *generation facilities* as specified in Market Manual 7.3: Outage Management” 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”.

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

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

- the *capacity storage resource* receives and follows sufficient *dispatch instructions* in the *energy market*,
- dispatches are within the *availability window*, and
- the dispatches are to at least the amount of their *capacity obligation*.

Failure of a *capacity storage 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*.

Testing of Capacity Dispatchable Load Resources

The *IESO* may direct *capacity dispatchable load 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 notified of their test in the following manner:
 - The resource will have a constraint applied to *withdraw* to its *capacity obligation* for the duration of the test.
- The *registered market participant* for the *facility* must ensure that *demand response energy bids* are submitted to at least their *capacity obligation*.
- If a resource being tested demonstrates a reduction in *energy* withdrawal from the *IESO* controlled grid equal to or greater than the *capacity obligation* for every interval for the duration (up to 4 hours) of the test (ramp intervals excluded), the test will be deemed a success.

Failure of the test will result in the applicable charges as specified in “Market Manual 5, Part 5.5: Physical Markets Settlement Statements”

In advance of the scheduled test activation, if a *capacity market participant* is aware of a planned or forced outage that will make the *capacity dispatchable load resource* unable to comply with the test activation 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* as specified in “Market Manual 7.3: Outage Management” and update the *demand response energy bids* 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 *demand response energy bids* where applicable, the test activation will not be deemed a failure and may be rescheduled by the *IESO* following the completion of the *outage*.

For a *capacity dispatchable load 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 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 during the *obligation period*.

Failure of a capacity dispatchable load 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*, or

A compliance investigation to be performed by the *IESO*.

Testing of 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 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 test activation. Resources will receive a schedule in *pre-dispatch* and real-time, regardless of the *demand response energy bid* price submitted.

In advance of the test activation, 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 test activation on the *dispatch day*, it is the responsibility of the *capacity market participant* 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* is unavailable, the test activation will not be deemed a failure and may be rescheduled by the *IESO* following the completion of the non-performance event.

An *HDR resource* test activation is considered valid, unless:

- The *capacity market participant* provides notice to the *IESO* of a non-performance event that would reduce the *demand response capacity* of the *HDR resource* to 0 MW,

- The IESO did not send either advisory, 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* 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* 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 five-minute interval
- The load reduction across each five-minute 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-based⁷ 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:

⁷ Non-test-based activation can refer to an in-market or emergency activation

- 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)
 - o 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 quantity⁸ (e.g. at least 85% of the bid quantity must be delivered), and
 - o 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

System-Backed Capacity Import Resources

The *IESO* may direct *system-backed 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 *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 4 hours.
- If a *system-backed 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 *system-backed 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 may be rescheduled by the *IESO* following the completion of the *outage*.

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:

⁸ 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.

- 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*.

Generator-Backed Capacity Import Resources

A *capacity market participant* with a *generator-backed capacity import resource* must complete a test activation once per *obligation period*. To complete the test activation, 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 the *capacity obligation* 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 *capacity obligation* 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; and
- 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 Test Activation 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”

Performance Assessment

The IESO will assess the results of the test activation 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 or greater than their *capacity obligation* for four consecutive hours within the required date and time, and successfully scheduled the corresponding import transaction for at least its *capacity obligation* into Ontario for at least one hour during the same time period, the test will be deemed a pass.

Failure of a *generator-backed capacity auction 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.

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* during the entirety of the first testing window. These circumstances are as follows:

- 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; or

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.

5.4 Measurement Data Audit

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*.

5.4.1 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

5.4.2 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.

5.4.3 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 data⁹ for the audit month and an additional two months of baseline.
- Actual measurement data¹⁰ meets the criteria defined in [Section 5.4.4](#) of the document.

5.4.4 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**¹¹ 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

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.

⁹ Submitted measurement data refers to the monthly Data submissions for the DR Resource in accordance with the Demand Response Submission Timelines.

¹⁰ Actual contributors' measurement data refers to the individually submitted Contributor Data through the DR Audit task in Online IESO.

¹¹ If a partial audit is conducted, the actual measurement data will only be assessed using Step 1 of the audit process.

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.

5.4.5 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.

5.4.6 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 test activation/emergency operating state activation payments, as detailed in Market Manual 5.5: Physical Markets Settlement Statements. 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:

- Availability requirements are not met (i.e. availability charge);
- Measurement data submission was not accurate, timely or complete (i.e. administration charge);
- *Dispatch instructions* were not followed (i.e. *dispatch* charge); and
- Failing a *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.

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
September	2.0
October	1.0
November	1.0

Month	Factor
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 during the *forward period* or *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*. 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 request¹²;
- 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 review the buy-out request within two *business days*. At the end of this review period, the IESO will either:

- a. Approve the buy-out request; if the participant has requested 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.

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 *capacity auction deposit* amount, at the participant's request, within ten *business days* after the IESO has received payment for the buy-out charge.

¹² 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.

- 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*.

– 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 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* 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: 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 enrolling is a *non-committed resource* associated with a *generation facility*;
2. The resource(s) meets 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 enrollment 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) 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*.

– End of Section –

Appendix E: 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 enrolling is 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 enrollment 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) 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 you have authority to make this attestation on behalf of the participating *capacity auction participant*.
5. You have authority to make this attestation on behalf of the participating *capacity auction participant*.

– End of Section –

Appendix F: 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* associated with 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 enroll 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 another *control area operator* 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*.

– End of Section –

Appendix G: 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 enrolling meets the requirements of a *generator-backed capacity auction eligible import resource*, which is 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*;

The definition of *generator-backed import contributor* is as follows:

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 enroll 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*.

– End of Section –

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

– End of Document –