



Market Manual 12.0: Capacity Auctions

Issue 17.0

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

Disclaimer

The posting of documents on this Website is done for the convenience of *market participants* and other interested visitors to the *IESO* Website. Please be advised that, while the *IESO* attempts to have all posted documents conform to the original, changes can result from the original, including changes resulting from the programs used to format the documents for posting on the Website as well as from the programs used by the viewer to download and read the documents. The *IESO* makes no representation or warranty, express or implied that the documents on this Website are exact reproductions of the original documents listed. In addition, the documents and information posted on this Website are subject to change. The *IESO* may revise, withdraw or make final these materials at any time at its sole discretion without further notice. It is solely your responsibility to ensure that you are using up-to-date documents and information.

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

Document ID	MAN-44
Document Name	Market Manual 12.0: Capacity Auctions
Issue	Issue 17.0
Reason for Issue	Issue released in advance of Baseline 52.0
Effective Date	August 9, 2024

Document Change History

Issue	Reason for Issue	Date
1.0	Issue released in advance of Baseline 34.1	September 30, 2015
2.0	Issue released for Baseline 34.1	December 2, 2015
3.0	Issue released in advance of Baseline 35.1	March 22, 2016
4.0	Issue released for Baseline 36.1	December 7, 2016
5.0	Issue released in advance of Baseline 37.0	January 11, 2017
6.0	Issue released in advance of Baseline 37.1	March 31, 2017
7.0	Issue released in advance of Baseline 42.1	October 15, 2019
8.0	Issue released in advance of Baseline 43.1. These changes are applicable to the <i>demand response auction</i> held in December 2019, for the <i>commitment period</i> beginning May 1, 2020.	April 23, 2020
9.0	Issue released in advance of Baseline 43.1. These changes are applicable to <i>capacity auctions</i> to be for <i>commitment periods</i> beginning on or after May 1, 2021.	May 4, 2020
10.0	Issue released in advance of Baseline 44.0	June 29, 2020
11.0	Issue released for Baseline 44.0	September 16, 2020
12.0	Updated to meet accessibility requirements pursuant to the <i>Accessibility for Ontarians with Disabilities Act</i>	December 2, 2020
13.0	Issue released for Baseline 46.0	September 15, 2021
14.0	Issue released in advance of Baseline 48.1	September 19, 2022
15.0	Issue released in advance of Baseline 50.0	August 31, 2023
16.0	Issue released in advance of Baseline 50.1	November 29, 2023
17.0	Updated in advance of Baseline 52.0	August 9, 2024

Related Documents

Document ID	Document Title
N/A	

Table of Contents

Table of Contentsi

List of Figures.....iv

List of Tablesv

Table of Changesvi

Market Manuals1

1. Introduction2

1.1 Purpose..... 2

1.2 Scope 2

1.3 Who Should Use This Manual 2

1.4 Contact Information 3

1.5 Applicability 3

2. Capacity Auction Overview4

2.1 Capacity Auction Process..... 4

2.2 Capacity Auction Timelines 4

2.3 Commitment Periods and Obligation Periods..... 5

2.4 Availability Window 6

2.5 Demand Curve Elements..... 6

2.5.1 Target Capacity 7

2.5.2 Capacity Auction Reference Price 7

2.5.3 Maximum and Minimum Auction Clearing Price..... 7

2.5.4 Capacity Limits 8

2.6 Zonal Constraints..... 8

2.7 Capacity Import Constraints 9

3. Pre-Auction Requirements.....10

3.1 Pre-Auction Reporting Obligations..... 10

3.2 Pre-Auction Authorization Process..... 11

3.3 Capacity Qualification 11

3.3.1 Capacity Qualification Request Submission 11

3.3.2 Capacity Qualification Assessment 14

3.4 Capacity Auction Deposit..... 17

4. Auction Mechanics	19
4.1 Stage 1: Offer Submission and Validation.....	19
4.2 Stage 2: Auction Clearing	20
4.3 Stage 3: Post-Auction Reporting Obligations	22
5. Post-Auction Requirements	23
5.1 Participant Authorization	23
5.1.1 Prudential Support.....	23
5.2 Registration Requirements.....	23
5.2.1 Contributor Management	25
5.3 Energy Market Participation	29
5.3.1 Outage Management/ Non-Performance Events.....	29
5.3.2 Demand Response Contributor Outages	29
5.3.3 Measurement Data Submissions.....	30
5.3.4 Testing of Capacity Auction Resources	33
5.4 Measurement Data Audit	43
5.4.1 Capacity Market Participant's Responsibilities	43
5.4.2 Virtual C&I <i>HDR Resource</i> Audit	44
5.4.3 Audit Scheduling and Submission of Supporting Documents .	44
5.4.4 Procedure to Conduct a Virtual C&I Hourly Demand Response Resource Audit.....	45
5.4.5 Audit Review and Remedial Actions	46
5.4.6 Closure of Audit	46
6. Settlements	47
6.1 Non-Performance Factors	47
7. Buy-out Process.....	49
8. Capacity Obligation Transfer.....	51
Appendix A: Template for DR Residential Contributor Management Registration	53
Appendix B: Template for Measurement Data Control Sheet.....	54
Appendix C: Template for Generator-Backed Capacity Import Resource Test Activation Data Submission	55
Appendix D: Attestation for Capacity Auction Eligible Generation Resource.....	56
Appendix E: Attestation for Capacity Auction Eligible Storage Resource.....	57

**Appendix F: Attestation for System-backed Capacity Auction
Eligible Import Resource58**

**Appendix G: Attestation for Generator-backed Capacity Auction
Eligible Import Resource59**

References60

Archive

List of Figures

Figure 2-1: Capacity Auction Process4

Figure 2-2: Downward Sloping Demand Curve7

Figure 4-1: Capacity Auction Mechanics Overview 19

Figure 4-2: Auction Selection Process with Zonal Limits21

Figure 5-1: Randomized Control Trials (RC) performance evaluation28

Figure 5-2: Sample CSV File Format for Measurement Data Submission for C&I hourly
demand response31

Figure 5-3: Sample CSV File Format for Measurement Data Submission for Residential
HDR.....32

List of Tables

Table 3-1: Additional Information Required for Qualification Request Submission by
Capacity Auction Resource Type12

Table 3-2: Availability De-Rating Factor by Capacity Auction Resource Type15

Table 3-3 Performance Adjustment Factor Calculation.....16

Table 5-1: Testing Procedure by Capacity Auction Resource Type34

Table 5-2: Capacity Test Performance Parameters by Capacity Auction Resource Type35

Table 5-3: Capacity Test Performance Parameters for Generator-backed Capacity Import
Resource40

Table 6-1: Non-Performance Factors47

Table of Changes

Reference (Section and Paragraph)	Description of Change
Section 3.3.2 and 5.3.4	Updated <i>performance adjustment factor</i> calculation.

Archive

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:

- Authorization as a *capacity auction participant*,
- Submission of a *capacity qualification request* to determine a *capacity auction resource’s* *unforced capacity*,
- Submission of a *capacity auction deposit*,
- 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 by *capacity market participants*,
- Testing of *capacity auction resources* by the IESO, and
- *Settlement process* applicable to *capacity obligations*, 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 qualify their *auction capacity* ahead of 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:

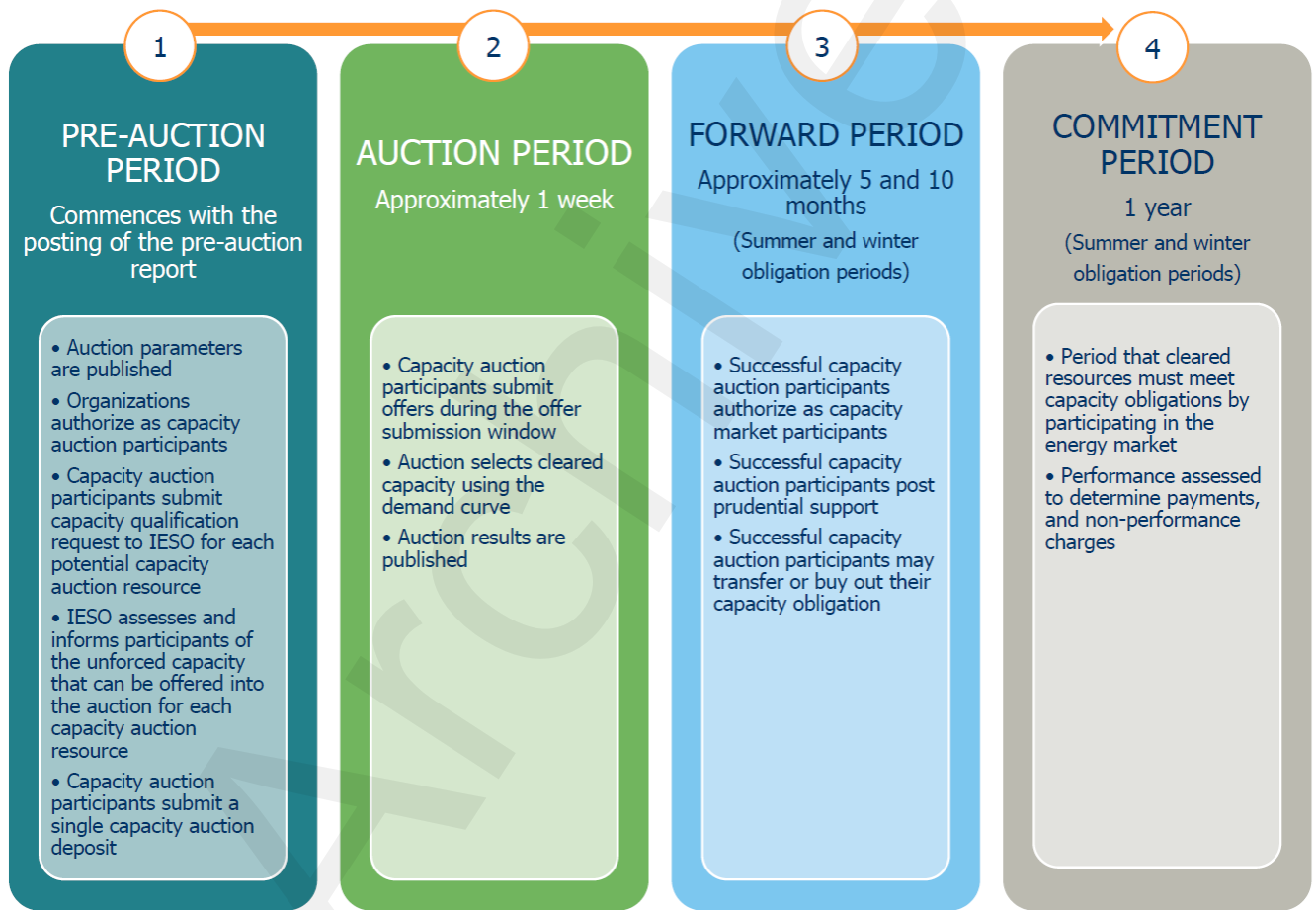


Figure 2-1: Capacity Auction Process

2.2 Capacity Auction Timelines

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

- The *IESO* will *publish* a pre-auction report prior to the start of the *capacity qualification request* submission window for the *capacity auction*.

- Any person intending to participate in the *capacity auction* must complete their authorization as *capacity auction participant* in advance of initiating a *capacity qualification request*, and no later than 16:00 EST, five *business days* prior to the start of the capacity qualification assessment window as specified in the pre-auction report.
- *Capacity auction participants* are required to submit a *capacity qualification request* during the *capacity qualification request* submission window, and identify each potential *capacity auction resource* and its corresponding *installed capacity (ICAP)*
- The *IESO* will complete a capacity qualification assessment to determine the *unforced capacity* of each potential *capacity auction resource*, and will notify the *capacity auction participant* of this value at the end of the capacity qualification assessment window as specified in the pre-auction report.
- *Capacity auction participants* are required to submit the *capacity auction deposit* by 16:00 EST 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.

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*.

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 seasonal demand curves, and will therefore have their own *capacity auction clearing prices* and quantities. Participants will receive a separate *capacity obligation* for each *obligation 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.

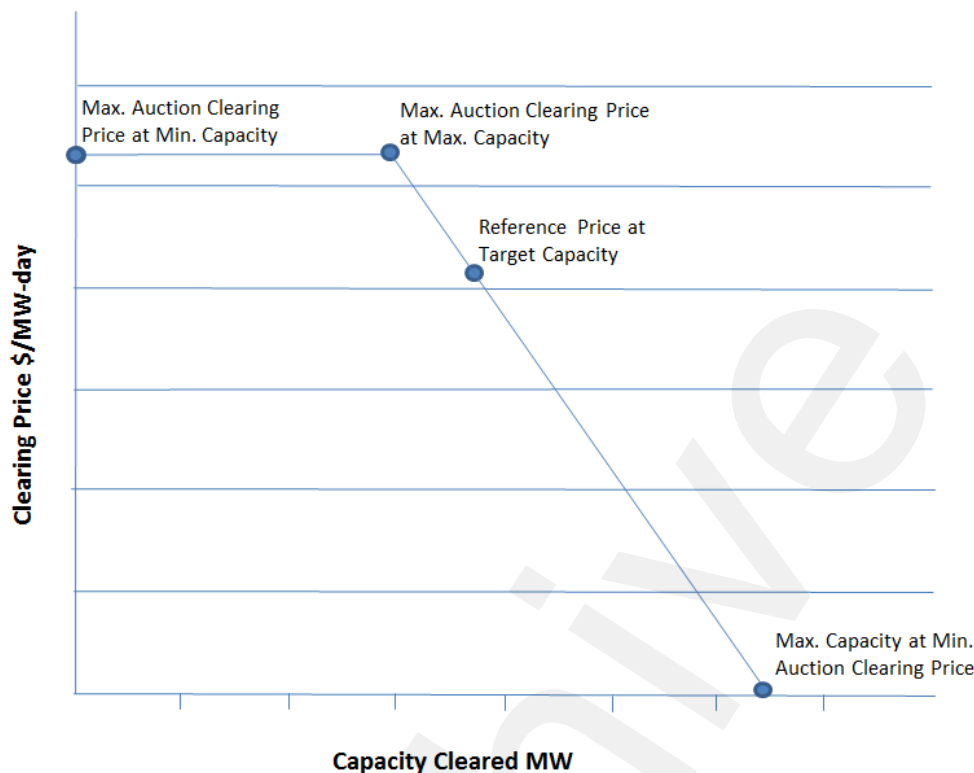


Figure 2-2: Downward Sloping Demand Curve

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 1.5 times the *capacity auction reference price*.

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

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

2.5.4 Capacity Limits

The capacity limits used in the demand curve are:

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

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

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

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

Where:

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

The maximum capacity is the maximum amount of *auction capacity* which the *IESO* will clear through the *capacity 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 *hourly demand response 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* in addition to 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 electricity 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*.

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 *capacity auction 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 -

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, capacity qualification, 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
- Eligible external interfaces for use by *system-backed capacity import resources* and *generator-backed capacity import resources*

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

- the dates for *capacity auction participants* to submit a *capacity qualification request*;
- the date by which the *IESO* will notify *capacity auction participants* of the *unforced capacity* of their potential *capacity auction resource*;
- the date by which *capacity auction participants* must post a *capacity auction deposit*;
- the dates that the *IESO* will conduct the *capacity auction* as well as the date by which the *IESO* will *publish* the public and confidential post-auction reports; 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 Qualification

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

Capacity auction participants who wish to participate in a *capacity auction* shall complete the capacity qualification process for each potential *capacity auction resource*. This process includes:

- The submission of a *capacity qualification request* by the *capacity auction participant*, including any additional information that is required based on the *capacity auction resource* type as outlined in section 3.3.1, and;
- The capacity qualification assessment by the IESO to determine the potential *capacity auction resource's* *unforced capacity* that can be offered into a *capacity auction*

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 a *capacity qualification request* up until the *capacity qualification request* submission window closes, and may withdraw a *capacity qualification request* up until the capacity qualification assessment window closes, per the timelines detailed in the pre-auction report. Both actions are completed in Online IESO¹.

For greater certainty, any person who is not an authorized *capacity auction participant* may not submit a *capacity qualification request*.

3.3.1 Capacity Qualification Request Submission

(market rules: Ch. 7, s. 18.2)

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 IESO, the following information in order to complete the *capacity qualification request*:

¹ 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).

- The *ICAP* of each potential *capacity auction resource*, for each *obligation period*,
 - For *generator-backed capacity auction eligible import resources*, the *ICAP* must be provided for each *generator-backed import contributor*
 - For *capacity auction eligible storage resources* and *generator-backed import contributors* that are *storage facilities*, the *ICAP* will be determined using additional information provided by the *capacity auction participant* as outlined in Table 3-1
- The *obligation period(s)* for which they may wish to submit *capacity auction offers*. Participants may choose to submit *capacity auction offers* for one or both *obligation periods*,
- The type of *capacity auction resource* that will satisfy a *capacity obligation* during the *commitment period*

Additional information is required for each *capacity auction resource* type, as specified in Table 3-1.

Table 3-1: Additional Information Required for Qualification Request Submission 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 acknowledging 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>. 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 temperature-sensitive maximum power rating of the resource that can be sustained for 1 hour (Full Power Operating Mode) • The temperature-adjusted maximum amount of energy in MWh (Energy Rating), that the resource is capable of delivering when it is fully charged <ul style="list-style-type: none"> • These two variables will be used to determine the <i>ICAP</i> of the <i>capacity storage resource</i> using the following formula: $ICAP = [\min(\text{Full Power Operating Mode}, \frac{\text{Energy Rating}}{4 \text{ hours}})]$ • The <i>registered facility</i> and associated resource that will satisfy the <i>capacity obligation</i> • A signed attestation acknowledging the eligibility requirements associated with a <i>capacity auction eligible storage resource</i> have been met. 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>

Capacity Auction Resource Type	Additional Information Required
<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 the eligibility requirements associated with a <i>system-backed capacity auction eligible import resource</i> have been met. 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 the eligibility requirements associated with a <i>generator-backed capacity auction eligible import resource</i> have been met. This attestation can be found in Appendix G: Attestation for Generator-backed Capacity Auction Eligible Import Resource • 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>For each <i>generator-backed import contributor</i> that is a <i>storage facility</i>, the following must be submitted:</p> <ul style="list-style-type: none"> • The temperature-sensitive maximum power rating of the resource that can be sustained for 1 hour (Full Power Operating Mode) • The temperature-adjusted maximum amount of energy in MWh (Energy Rating), that the resource is capable of delivering when it is fully charged <ul style="list-style-type: none"> • These two variables will be used to determine the <i>ICAP</i> of the <i>capacity storage resource</i> using the following formula: $ICAP = \left[\min \left(\text{Full Power Operating Mode}, \frac{\text{Energy Rating}}{4 \text{ hours}} \right) \right]$ • Resource name • Resource ID (i.e. the unique numeric identifier for the <i>generation facility</i> as assigned by an external jurisdiction) • <i>Elapsed time to dispatch</i> <p>For each <i>generator-backed import contributor</i> that is a <i>generation facility</i>, the following also must be submitted:</p>

Capacity Auction Resource Type	Additional Information Required
	<ul style="list-style-type: none"> • Accredited <i>unforced capacity</i> rating as provided from an <i>IESO</i>-approved external jurisdiction • Fuel type • <i>minimum loading point</i> • Resource name • Resource ID (i.e. the unique numeric identifier for the <i>generation facility</i> as assigned by an external jurisdiction)
<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) • The obligation type (physical or virtual) and <i>demand response contributor</i> type (Residential or Commercial & Industrial). Refer to Section 5.2.1 for details on submitting <i>demand response contributor</i> information in the <i>forward period</i> and <i>obligation period</i>.

3.3.2 Capacity Qualification Assessment

(*market rules*: Chapter 7, section 18.2A)

Based on the information provided by the *capacity auction participant* as part of the *capacity qualification request*, the *IESO* will do as follows to assess each potential *capacity auction resource's unforced capacity*:

- Ensure that the *capacity market participant* has not been disqualified from *capacity auction* participation as outlined in Ch.7 of the *market rules*; and
- Determine the *unforced capacity* that each potential *capacity auction resource* can offer into the *capacity auction* for the summer and/or winter *obligation periods* using a resource specific calculation as outlined in Ch. 7 of the *market rules*. This calculation may include applying an *availability de-rating factor* and *performance adjustment factor*, as *applicable*, which will be calculated as outlined below in this section.

Availability De-Rating Factor

Equivalent Forced Outage Rate on Demand (EFOR_d)

An EFOR_d is used to calculate the *availability de-rating factor* for *capacity auction eligible generation resources* that are dispatchable thermal, and *capacity auction eligible storage resources*. The EFOR_d applicable to each resource type shall be calculated in accordance with the *IESO's* Annual Planning Outlook.

Top 200 Hours of Ontario Demand

The top 200 hours of Ontario Demand per season approach is used to assess performance during the roughly 5% of peak hours per year, and is used as part of the *availability de-rating factor* for *capacity generation resources* that are dispatchable hydro, and *capacity dispatchable load resources*. This sample size is expected to capture an accurate reflection of the *capacity auction resource's* contributions and availability during hours of system peak.

Ontario Demand is determined in accordance with the methodology detailed in section 1.6.7.8 of Market Manual 5.5: Physical Markets Settlement Statements.

Table 3-2: Availability De-Rating Factor by Capacity Auction Resource Type

Capacity Auction Resource Type	Availability De-Rating Factor Calculation
<i>Capacity auction eligible generation resource</i> (Dispatchable Thermal)	1- EFOR _d Where: EFOR _d is based on 5 years of historical data. For <i>capacity generation resources</i> with less than 5 years of historical data, the EFOR _d will be the median EFOR _d of Ontario's entire thermal generation fleet over the previous 5 year period, excluding Lennox Generating Station.
<i>Capacity auction eligible generation resource</i> (Dispatchable Hydro)	$\text{Median}\left[\frac{\text{AQEI} + \text{SQROR}}{\text{MAPC}}\right]$ in Top 200 hours of Ontario Demand per season for the last 5 years Where: <ul style="list-style-type: none"> AQEI is the Allocated Quantity of Energy Injected, as defined in Section 3.1.9 of Ch. 9 of the <i>market rules</i> SQROR is the Scheduled Quantity of Class r Operating Reserve, as defined in Section 3.1.4 of Ch. 9 of the <i>market rules</i> MAPC is the Maximum Active Power Capability, in MW, under any conditions without <i>station service</i> being supplied by the <i>generation unit</i> For <i>capacity auction eligible generation resources</i> that are dispatchable hydro with less than 5 years of historical data, the median value will be calculated using the data of all dispatchable hydro resources located in the electrical zone in which the <i>capacity auction eligible generation resource</i> is located. Where there is no dispatchable hydro generation in such electrical zone, the median value will be calculated using the data of all dispatchable hydro resources in Ontario.
<i>Capacity auction eligible storage resource</i>	1- EFOR _d Where: EFOR _d equals 5%
<i>Capacity dispatchable load resource</i>	$\text{Median}\left(\frac{\text{hourly bids quantity}}{\text{maximum seasonal energy bid quantity}}\right)$ in top 200 hours of Ontario Demand per <i>obligation period</i> from the most recent complete <i>obligation period</i>

Capacity Auction Resource Type	Availability De-Rating Factor Calculation
	<p>Where:</p> <ul style="list-style-type: none"> • ‘Hourly <i>bids</i> quantity’ is the quantity of <i>energy</i> up to the <i>capacity obligation</i> amount, in MW, that was <i>bid</i> in an hour during the most recent complete obligation period at an amount less than the <i>MMCP</i> • ‘Maximum seasonal energy <i>bid</i> quantity’ is the maximum <i>bid</i> quantity up to the <i>capacity obligation</i> amount, in MW, that was <i>bid</i> during the most recent complete obligation period <p>For <i>capacity dispatchable load resources</i> that did not hold a <i>capacity obligation</i> in the most recent complete obligation period, the median value will be calculated using the data of all <i>capacity dispatchable load resources</i> in Ontario that held a <i>capacity obligation</i> during the relevant obligation period, excluding Sir Adam Beck Pump Generating Station and <i>electricity storage facilities</i>.</p>

Performance Adjustment Factor

A *performance adjustment factor* is calculated for each *obligation period* and is based on a *capacity auction resource’s* performance in a *capacity auction capacity test* that was conducted in accordance with section 5.3.4 of this *market manual*. The *capacity auction capacity test* performance that is used by the *IESO* in the calculation of the *performance adjustment factor* will be from the most recent seasonal *obligation period* for which data is available.

The *performance adjustment factor* will be calculated as outlined below.

If a *capacity auction resource* either:

1. Passed the *capacity auction capacity test* in the applicable *obligation period*, or;
2. Was not subject to a *capacity auction capacity test* in the applicable *obligation period*,

The *performance adjustment factor* will be equal to 1. This will result in no impact to the *capacity auction resource’s* *unforced capacity*.

If the *capacity auction resource* failed the *capacity auction capacity test* in the applicable *obligation period*, the *performance adjustment factor* will be calculated in accordance with Table 3-3.

Table 3-3 Performance Adjustment Factor Calculation

Submitted <i>Installed Capacity (ICAP)</i>	<i>Performance Adjustment Factor</i>
<p>Less than or equal to the PAF Delivered MW from the most recent applicable seasonal <i>capacity auction capacity test</i></p> <p>Where:</p> <p>PAF Delivered MW is as described in section 5.3.4 of this manual</p>	<p><i>performance adjustment factor</i> = 1</p> <p>This will result in no impact to the <i>capacity auction resource’s</i> <i>unforced capacity</i></p>

Submitted <i>Installed Capacity (ICAP)</i>	<i>Performance Adjustment Factor</i>
Greater than or equal to the <i>cleared ICAP</i> the <i>capacity auction resource</i> was assessed against in the most recent applicable seasonal <i>capacity auction capacity test</i>	<p><i>Performance adjustment factor</i> = PAF Delivered MW / Previous <i>cleared ICAP</i></p> <p>Where:</p> <p>PAF Delivered MW is as described in section 5.3.4 of this manual</p> <p>Previous <i>cleared ICAP</i> is the <i>cleared ICAP</i> the <i>capacity auction resource</i> was assessed against in the most recent applicable seasonal <i>capacity auction capacity test</i></p>
Less than <i>cleared ICAP</i> the <i>capacity auction resource</i> was assessed against in the most recent applicable seasonal <i>capacity auction capacity test</i> and greater than the PAF Delivered MW from the most recent applicable seasonal <i>capacity auction capacity test</i>	<p><i>Performance adjustment factor</i> = PAF Delivered MW / submitted <i>ICAP</i></p> <p>Where:</p> <p>PAF Delivered MW is as described in section 5.3.4 of this manual</p>

If the *performance adjustment factor* calculated pursuant to Table 3-3 is less than 0.75, a *performance adjustment factor* of 0.75 will be applied.

Any *performance adjustment factor* applied will not be reassessed as a result of a measurement data audit conducted pursuant to section 5.4.

3.4 Capacity Auction Deposit

(market rules: Ch. 7, ss. 18.2, 18.3, and 18.4)

Following the receipt of the *unforced capacity* from the IESO, all *capacity auction participants* wishing to submit *capacity auction offers* into the *capacity auction* are each required to provide to the IESO a single *capacity auction deposit*. 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* as follows:

$$\text{Capacity auction deposit} = 3\% * (\text{total unforced capacity} * \text{maximum auction clearing price per MW-day}) * 125 \text{ business days}$$

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:

$$\text{Capacity auction deposit} = 3\% * (\text{transferred auction capacity} * \text{maximum auction clearing price per MW-day}) * 125 \text{ business days}$$

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:

$$\text{Partial capacity auction deposit release} = 3\% * (\text{transferred auction capacity} * \text{maximum auction clearing price per MW day}) * 125 \text{ business days}$$

– End of Section –

4. Auction Mechanics

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

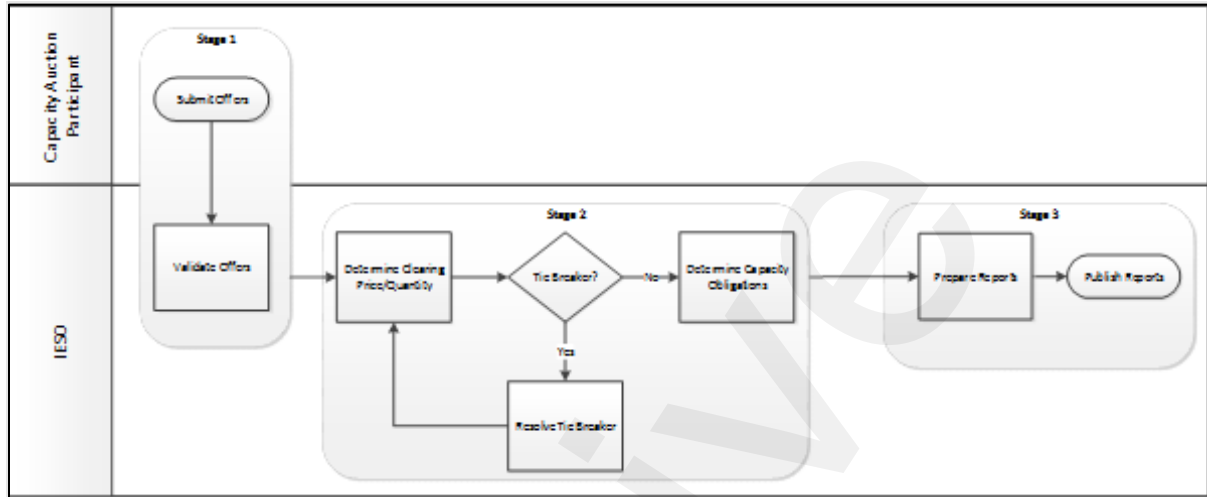


Figure 4-1: Capacity Auction Mechanics Overview

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 qualification process for any quantity between 1 MW and the *unforced 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 *unforced 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.

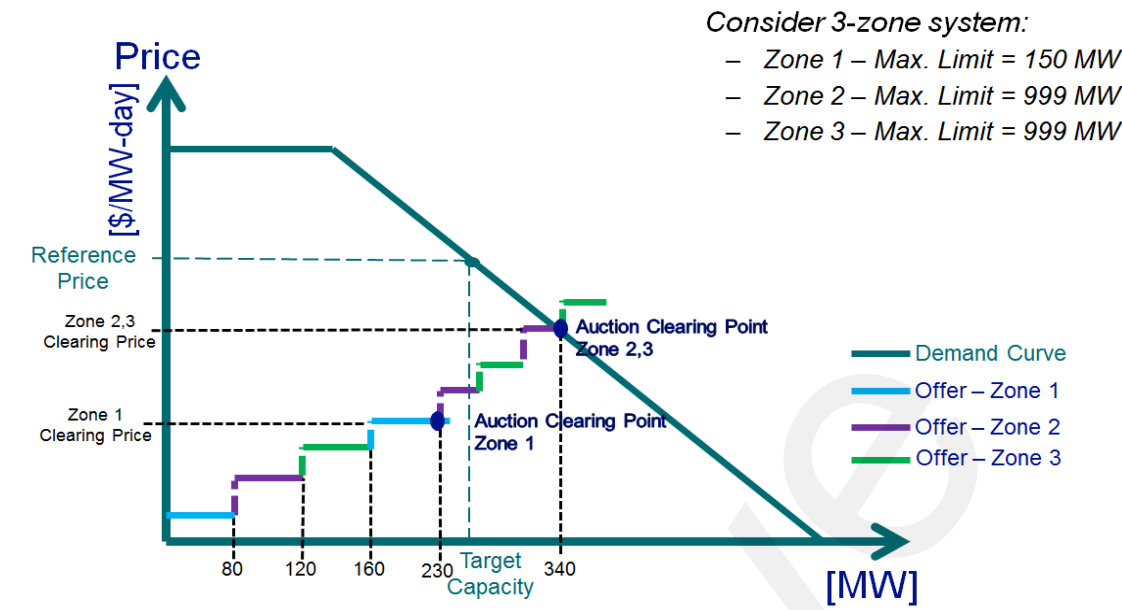


Figure 4-2: Auction Selection Process with Zonal Limits

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. This clearing price 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 stamp² 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*.

² 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.

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)*, and *cleared ICAP* as calculated pursuant to Ch. 7, s. 18.8 of the *market rules*
- 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. 7, s. 18.2.3)

There are post-auction authorization and registration requirements for *capacity auction participants* who have successfully 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

(market rules: Ch. 2, s. 5B)

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*:

- For existing *capacity auction resources*, this is done during the capacity qualification process in the pre-auction period.
- For new *demand response resources* (i.e. *demand response resources* that did not exist at the time of the capacity qualification process), this is done during the *forward period* (upon completion of registration of the *energy market resources*).
- 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 qualification 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*, a *capacity market participant* with a physical *capacity obligation* must be the registered owner, as described in “Market Manual 1.5: Market Registration Procedures”, of the *registered facility* associated with the *capacity auction resource*. *Capacity market participants* participating with a *generator-backed capacity import resource* must be the owner of the *generator backed import contributors* as attested to during the *capacity qualification request* in the pre-auction period. *Capacity market participants* participating with virtual *hourly demand response 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 *hourly demand response resource* or as a *dispatchable load* (for example, a *non-dispatchable load* could be registered as an *hourly demand response 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 *hourly demand response resource* and must register only one *demand response resource* for each *capacity obligation*. *Capacity market participants* with a virtual *hourly demand response resource*

must indicate the contributor type associated with such virtual *hourly demand response resource* (residential or commercial/ industrial/ institutional load type, as applicable).

Capacity market participants with a virtual *capacity obligation* participating with a virtual *hourly demand response resource* may include multiple *demand response contributors*, provided such *demand response contributors* are of the same contribution type as the virtual *hourly demand response resource*. *Demand response contributors* for a virtual *hourly demand response 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 *hourly demand response 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 *hourly demand response 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 *hourly demand response resources* consisting of commercial, industrial, institutional and/or *non-dispatchable loads* (C&I) that can be classified as:
 - a. Virtual C&I *demand response contributors*; and
 - b. Physical C&I *demand response contributors*;

2. Virtual *hourly demand response resources* consisting of residential³ smart-metered loads that can be classified as:
 - a. Virtual residential *demand response contributors*

Virtual C&I hourly demand response Contributors registration requirements:

For virtual C&I *demand response 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.

³A residential customer refers to a smart-metered service account that is billed (by a licensed local distribution company) on a residential-rate class specified in a rate-order produced by the *Ontario Energy Board*. For the purposes of this program the term 'residential', as intended by the *IESO*, excludes 'net-metered' and/or 'unit sub-metered' customers.

- Location of the metering installation and meter point reference identification (as indicated on contributors' Record of Installation)
- If behind-the-meter generation, indicate generation location and nameplate information (MVA/kVA rating, output voltage)

Physical C&I hourly demand response Contributors registration requirements:

For physical C&I *demand response 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 *hourly demand response 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 hourly demand response Contributors registration requirements:

For virtual residential *demand response 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 *hourly demand response 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 *hourly demand response 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 *hourly demand response 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 *hourly demand response 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.

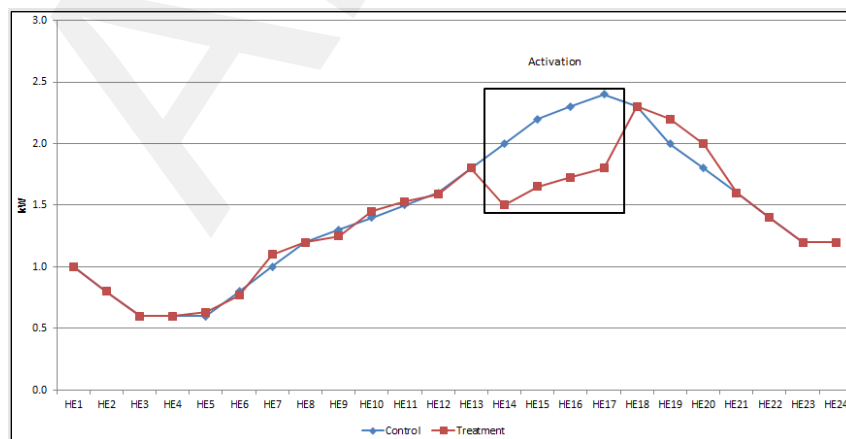


Figure 5-1: Randomized Control Trials (RC) performance evaluation

Refer to “Market Manual 5.5: Physical Markets Settlement Statements” for a further description of how residential *hourly demand response resource* 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 5.3.4](#). *Capacity market participants* with *capacity obligation(s)* associated with *hourly demand response resources* will be compensated for *capacity auction dispatch tests* and *emergency operating state* 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 *hourly demand response resources* are required to maintain records of all non-performance events as set out in Market Manual 7.3: Outage Management.

Capacity market participants with virtual *hourly demand response resources* that experience a *contributor outage* that meets the requirements of section 19.4.10A of Chapter 7 may report it in accordance with section 5.3.2.

5.3.2 Demand Response Contributor Outages

(*market rules*: Ch. 7, ss. 19.4.10A, 19.4.10B)

Capacity market participants may temporarily exclude one or more *demand response contributor(s)* from their virtual C&I *hourly demand response resource* due to a *contributor outage* that meets the requirements set out in the *market rules*.

In order to declare a *contributor outage*, a written request must be submitted to the IESO by the registered *capacity auction* contact via email to customer.relations@ieso.ca within 5 business days following the activation event.

The email must contain the following information for each activation event which the *capacity market participant* declares a *contributor outage*:

- *Capacity market participant* name
- *Capacity obligation* ID
- *Capacity auction resource* name and ID
- Date of activation
- Name and ID of *Demand response contributor* on outage

- Start and stop time of the *outage*
- Bids reduction in MW for the activation, if applicable

5.3.3 Measurement Data Submissions

For Virtual C&I HDR resource (s):

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

- Virtual *demand response contributors* with a uni-directional meter type, the uni-directional interval meter readings will be recorded in the summation of Channel 1 (kWh delivered) energy quantities. Channel 2 (received) energy is recorded as zero for that *demand response contributor*
- Virtual *demand response contributors* with a bi-directional meter type, the *demand response contributor's* bi-directional interval meter readings must be netted (kWh delivered – kWh received) and recorded as follows:
 - 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. If there are virtual *demand response contributors* with declared *contributor outage(s)*, the *capacity market participant* shall exclude the data of the virtual C&I *demand response contributors* on *outage* from the summation and submission.

- If there are multiple activations within one month and a *contributor outage* has been declared in relation to at least one such activation, the *capacity market participant* shall submit measurement data for each activation through Online IESO.

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 hourly demand response

For Virtual Residential *hourly demand response 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),
 - 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 contributor* 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 Hourly Demand Response Contributors

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

Capacity market participants must submit a “Measurement Data Control Sheet” with each measurement data submission identifying *demand response contributors* with VEE data (if applicable) or with declared *contributor outage(s)*. 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).

5.3.4 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)

Capacity Auction Capacity Test

Hourly Demand Response Resources, Capacity Dispatchable Load Resources, Capacity Generation Resources, and Capacity Storage Resources

Each *obligation period*, the IESO will determine a consecutive five-*business day* window (the “**testing window**”) within which applicable *capacity auction resources* shall conduct their *capacity auction*

capacity test. The IESO shall issue an advisory notice indicating when the testing window will be scheduled, a minimum of 10 *business days* in advance of the testing window. To execute a *capacity auction capacity test*, the *capacity market participant* will be required to schedule their *capacity auction resource* for activation in the *energy market* to its *cleared ICAP* and then deliver to that *cleared ICAP* amount for a resource-specific duration of time, within the testing window and within the applicable availability window.

Refer to Table 5-1 below for more details on the specific testing procedure that *capacity market participants* shall follow to fulfill their *capacity auction capacity test* requirements for each *capacity auction resource type*.

Table 5-1: Testing Procedure by Capacity Auction Resource Type

<i>Capacity Auction Resource Type</i>	Testing Procedure
<i>Capacity generation resources</i>	<ol style="list-style-type: none"> 1. Submit <i>offers</i> that ensure the resource receives a generation schedule in the <i>energy market</i> to at least the greater of its <i>cleared ICAP</i> and its <i>minimum loading point</i> for at least <u>four consecutive hours</u> 2. Supply, within the parameters defined in Table 5-2 below, at least the greater of either its <i>cleared ICAP</i> and its <i>minimum loading point</i> for <u>four consecutive hours</u>
<i>capacity storage resources</i>	<ol style="list-style-type: none"> 1. Submit <i>offers</i> that ensure the resource receives a generation schedule in the <i>energy market</i> to at least the greater of its <i>cleared ICAP</i> and its <i>minimum loading point</i> for at least <u>four consecutive hours</u> 2. Inject, within the parameters defined in Table 5-2 below, at least the greater of either its <i>cleared ICAP</i> and its <i>minimum loading point</i> for <u>four consecutive hours</u>
<i>Capacity dispatchable loads</i>	<ol style="list-style-type: none"> 1. Submit <i>bids</i> that ensure the resource gets scheduled to consume at least its <i>cleared ICAP</i>. Then subsequently modify its <i>bids</i> so that the resource is scheduled to consume an amount that is lower than its previously scheduled amount by an amount at least equal to its <i>cleared ICAP</i>⁴. 2. Reduce withdrawal of <i>energy</i>, within the parameters defined in Table 5-2 below, by at least the resource's <i>cleared ICAP</i> for at least <u>three consecutive dispatch intervals</u>, excluding ramp intervals required to respect the resource's ramp rate
<i>Hourly demand response resources</i>	<ol style="list-style-type: none"> 1. Submit <i>bids</i> that will ensure the resource receives a schedule (activation notice) to reduce withdrawal of energy by an

⁴ Note - availability charges may apply as specified in Market Manual 5.5: Physical Markets Settlement Statements if the *capacity dispatchable load* reduces its bid quantity.

Capacity Auction Resource Type	Testing Procedure
	<p>amount at least equal to its <i>cleared ICAP</i> for <u>four consecutive hours</u></p> <p>2. Reduce withdrawal of <i>energy</i>, within the parameters defined in Table 5-2 below, by at least the resource's <i>cleared ICAP</i></p>

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

Data Submission Requirements

Capacity market participants must notify the *IESO* of the specific day, hours and *dispatch intervals* for which they wish their performance to be assessed. This notification can be sent in the form of an email to capacity.auction@ieso.ca with the subject heading “Capacity Auction Capacity Test: Participant Name, Obligation ID”, and must be sent by the following due date:

- For *capacity dispatchable load resources*, *capacity generation resources*, *physical hourly demand response resources*, and *capacity storage resources*, no later than five *business days* after the end of the testing window,
- For virtual *hourly demand response resources*, no later than the measurement data submission deadline associated with the month in which the *capacity auction capacity test* was conducted, as outlined in section 5.3.3 of this *market manual 12*.

In addition, *capacity market participants* with virtual *hourly demand response resources* must submit measurement data in accordance with section 5.3.3 of this *market manual 12*.

Failure of a *capacity market participant* to notify the *IESO* by the applicable deadline may result in non-performance charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements” and failure of the *capacity auction capacity test* as specified below.

Capacity Auction Capacity Test Performance Assessment

The *IESO* will assess the performance results (rounded to one decimal place) of the *capacity auction capacity test* using the parameters listed in Table 5-2 below.

Table 5-2: Capacity Test Performance Parameters by Capacity Auction Resource Type

Capacity Auction Resource Type	If...	Then...
Capacity generation resource	The <i>capacity auction resource</i> supplies, on average for each hour of its 4 consecutive hour test duration, at least 95% of its <i>cleared ICAP</i>	The test is a pass
	The <i>capacity auction resource</i> supplies, on average for any hour of the test, less than 95% of its <i>cleared ICAP</i>	The test is a fail

<i>Capacity Auction Resource Type</i>	<i>If...</i>	<i>Then...</i>
<i>capacity storage resource</i>	The <i>capacity auction resource</i> injects, on average for each hour of its 4 consecutive hour test duration, at least 95% of its <i>cleared ICAP</i>	The test is a pass
	The <i>capacity auction resource</i> injects, on average for any hour of the test, less than 95% of its <i>cleared ICAP</i>	The test is a fail
<i>Capacity dispatchable load resource</i>	The <i>capacity auction resource</i> reduces its withdrawal of <i>energy</i> , on average over at least 3 consecutive <i>dispatch intervals</i> (excluding ramp intervals required to respect the resource's ramp rate), by at least 95% of its <i>cleared ICAP</i>	The test is a pass
	The <i>capacity auction resource</i> reduces its withdrawal of <i>energy</i> , on average over at least 3 consecutive <i>dispatch intervals</i> (excluding ramp intervals required to respect the resource's ramp rate), by less than 95% of its <i>cleared ICAP</i>	The test is a fail
<i>Hourly demand response resource</i>	The <i>capacity auction resource</i> reduces its withdrawal of <i>energy</i> , on average for each hour of its 4 consecutive hour test duration, by at least 90% of its <i>cleared ICAP</i> as determined pursuant to section 1.6.26.3.5 of Market Manual 5.5: Physical Markets Settlement Statements	The test is a pass
	The <i>capacity auction resource</i> reduces its withdrawal of <i>energy</i> , on average for any hour of the test, by less than 90% of its <i>cleared ICAP</i> as determined pursuant to section 1.6.26.3.5 of Market Manual 5.5: Physical Markets Settlement Statements	The test is a fail

Following the assessment of the *capacity auction capacity test* by the *IESO*, the *IESO* shall notify the *capacity market participant* of the result including the following information:

- Confirmation of the day, hours and *dispatch intervals* used in the assessment
- The amount of *auction capacity* determined to have been delivered by the *capacity auction resource* over the resource specific amount of time detailed in Table 5-2
- Confirmation of whether the *capacity auction resource* has passed or failed the *capacity auction capacity test* in accordance with the parameters detailed in Table 5-2

If the *capacity market participant* does not notify the *IESO* of their completed *capacity auction capacity test* by the deadline stated above, the *capacity auction resource* will be deemed to have delivered zero MW which will result in a failure of the *capacity auction capacity test*.

PAF Delivered MW

If a *capacity auction resource* fails the *capacity auction capacity test*, the IESO will use the performance results as calculated pursuant to Table 5-2 to determine a PAF Delivered MW value. The PAF Delivered MW will be used to determine the *performance adjustment factor* pursuant to section 3.3.2 of this market manual.

For an *hourly demand response resource*, the PAF Delivered MW is the four-hour average reduction in withdrawal of *energy* in the *capacity auction capacity test*. If the PAF Delivered MW value is greater than 90% of the *hourly demand response resource's cleared ICAP*, then the PAF Delivered MW will be equal to 90% of the *cleared ICAP*.

For a *capacity generation resource* or *capacity storage resource*, the PAF Delivered MW is the four-hour average injection of *energy* in the *capacity auction capacity test*. If the PAF Delivered MW value is greater than 95% of the *capacity auction resource's cleared ICAP*, then the PAF Delivered MW will be equal to 95% of the *cleared ICAP*.

For a *capacity dispatchable load resource*, the PAF Delivered MW is the average reduction in withdrawal of *energy* over the three consecutive *dispatch intervals* of the *capacity auction capacity test*. If the PAF Delivered MW value is greater than 95% of the *capacity auction resource's cleared ICAP*, then the PAF Delivered MW will be equal to 95% of the *cleared ICAP*.

Allowable Exceptions

The IESO will, where the circumstances permit, schedule an additional testing window if a *capacity auction resource* is unable to complete the *capacity auction capacity test* during the entirety of the first testing window in the following circumstances:

1. The *capacity auction resource* is unable to complete the *capacity auction capacity test* during the testing window due to an *outage* caused by a third party *market participant*. In such cases, the *capacity market participant* must notify the IESO by emailing capacity.auction@ieso.ca no later than five *business days* after the end of the testing window and provide evidence, originating from the third party *market participant*, that the failure to complete the *capacity auction capacity test* was due to the actions of the third party.
2. The *capacity auction resource* is unable to complete the *capacity auction capacity test* 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*.
3. The *capacity auction resource* is unable to complete the *capacity auction capacity test* during the testing window as doing so would endanger the safety of any person, damage equipment, or violate any *applicable law* as outlined in Ch. 7, Section 7.5.3 of the *market rules*. In such cases, the *capacity market participant* must adhere to the requirements as outlined in Ch. 7, Section 7.5.2 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 adhered to the requirements in the *market rules*.

Assessment of In-Period Cleared UCAP Adjustment for Hourly Demand Response Resources

The *IESO* will apply an in-period *cleared UCAP* adjustment in accordance with Ch. 7, section 19.4.18 of the *market rules*.

An in-period *cleared UCAP* adjustment will apply in the form of a de-rate using the following formula:

In-Period *Cleared UCAP* Adjustment De-rate = $1 - (\text{Delivered MW} / \text{cleared UCAP})$

Where:

- Delivered MW is equal to the average amount of *auction capacity* delivered by the *hourly demand response resource* over the four-hour *capacity auction capacity test*, and;

Using this de-rate, the *cleared UCAP* of the *hourly demand response resource* will be adjusted using the following formula:

Adjusted *cleared UCAP* = *cleared UCAP* X (1 - in-period *cleared UCAP* adjustment de-rate)

Any in-period *cleared UCAP* adjustment will not be reassessed as a result of a measurement data audit conducted pursuant to [section 5.4](#).

System-Backed Capacity Import Resources

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

The test will be conducted as follows:

- Up to two hours in advance of any test, applicable *system-backed capacity import resources* will receive a schedule to import *energy* to at least its *cleared ICAP* in the last hour of pre-dispatch prior to the *dispatch hour* (PD-1). Tests may be scheduled for a duration of up to four consecutive hours.
- If the *system-backed capacity import resource* being tested is successfully⁵ scheduled in *pre-dispatch* and:
 - is not curtailed, the test will be a pass,
 - is fully or partially curtailed with reason code “OTH” or “MrNh”⁶, the test will be a fail,
 - is fully or partially curtailed with any other reason code, the test will be invalid.
- Failure of the test will result in the applicable charges as specified in “Market Manual 5.5: Physical Markets Settlement Statements.”
- An invalid test will be rescheduled at the *IESO*’s discretion.

If a *system-backed capacity import resource* is unable to comply with the *capacity auction capacity test* on the *dispatch day* for a bona fide and legitimate reason as outlined in Ch. 7, Section 7.5.8A of the

⁵ A successfully scheduled import transaction for a *system-backed capacity import resource* is one that meets the applicable import offer requirements outlined in the “Capacity Imports” section of Market Manual 4.2.

⁶ These curtailment reason codes are described in Market Manual 4.3: Real-Time Scheduling of the Physical Markets, Section 6.6 – Transaction Coding.

market rules, or due to a *force majeure event*, 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”. In such cases, the *IESO* will confirm that the *system-backed capacity import resource* has met the relevant *market rule* requirements and may reschedule a subsequent *capacity auction capacity test*.

Following the assessment of the *capacity auction capacity test* by the *IESO*, the *IESO* shall notify the *capacity market participant* of the result including the following information:

- Confirmation of the day, hours and *dispatch intervals* used in the assessment;
- The amount of *auction capacity* determined to have been delivered by the *system-backed capacity import resource* over the duration of the test; and
- Confirmation of whether the *capacity auction resource* has passed or failed the *capacity auction capacity test* in accordance with the parameters detailed above in this section.

PAF Delivered MW

If the *system-backed capacity import resource* fails the *capacity auction capacity test*, the *IESO* will determine the *performance adjustment factor* pursuant to section 3.3.2 of this *market manual* using the PAF Delivered MW value.

The PAF Delivered MW is calculated by averaging the hourly amount of energy scheduled by the *system-backed capacity import resource* from all hours of the *capacity auction capacity test*. If the PAF Delivered MW value is greater than the *system-backed capacity import resource's cleared ICAP*, then the PAF Delivered MW will be equal to the *cleared ICAP*.

Generator-Backed Capacity Import Resources

A *capacity market participant* with a *generator-backed capacity import resource* must complete a *capacity auction capacity test* once per *obligation period*. To complete the test activation, the *capacity market participant* must successfully schedule:

- Its *generator-backed import contributor(s)* in their host energy market to supply at least, in aggregate, the *generator-backed capacity import resource's cleared ICAP*, and supply at least 95% of the *cleared ICAP* into the host *control area's* grid for four consecutive hours within the *availability window*, on a date that falls within the first two months of the applicable *obligation period*, and;
- An import transaction from the host *control area* into Ontario at the designated *intertie*⁷ of at least the *capacity auction resource's cleared ICAP* for at least one hour that coincides with the timing of the scheduled four-hour test activation.

Data Submission Requirements

The data submission for each *generator-backed capacity import resource* 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:

⁷ Refer to the “Capacity Imports” section in Market Manual 4.2 for more information on import *offer* requirements for *generator-backed capacity import resources*.

- Resource ID of each *generator-backed import contributor(s)* associated with the test activation of 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 from each *generator-backed import contributor(s)* associated with the test activation of the *generator-backed capacity import resource* for each interval, provided to one decimal place.

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 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 *capacity auction capacity test* using the parameters in Table 5-3 below.

Table 5-3: Capacity Test Performance Parameters for Generator-backed Capacity Import Resource

If the <i>generator-backed capacity import resource</i> ...	Then...
1. Demonstrates through its data submission, on average for each hour of its 4 consecutive hour test duration, an injection of electricity equal to or greater than 95% of its <i>cleared ICAP</i> into the host control area’s grid, and 2. Successfully schedules the corresponding import transaction ⁸ equal to or greater than its <i>cleared ICAP</i> into Ontario for at least one of the four consecutive test hours	The test is a pass
1. Demonstrates through its data submission, on average for any hour of its 4 consecutive hour test duration, an injection of electricity less than 95% of its <i>cleared ICAP</i> into the host control area’s grid, or	The test is a fail

⁸ A successful import transaction for a *generator-backed capacity import resource* is one that is neither partially nor fully curtailed, and meets the applicable import offer requirements outlined in the “Capacity Imports” section of Market Manual 4.2.

If the <i>generator-backed capacity import resource</i> ...	Then...
2. Is unable to successfully schedule the corresponding import transaction ⁸ equal to or greater than its <i>cleared ICAP</i> into Ontario for at least one of the four consecutive test hours	

Following the assessment of the *capacity auction capacity test* by the *IESO*, the *IESO* shall notify the *capacity market participant* of the result including the following information:

- Confirmation of the day, hours and intervals used in the assessment
- The amount of *auction capacity* determined to have been delivered by the *capacity auction resource* over the test duration
- Confirmation of whether the *generator-backed capacity import resource* has passed or failed the *capacity auction capacity test* in accordance with the parameters detailed in Table 5-3

PAF Delivered MW

If the *generator-backed capacity import resource* fails the *capacity auction capacity test*, the *IESO* will determine the *performance adjustment factor* pursuant to section 3.3.2 of this *market manual* using the PAF Delivered MW value.

The PAF Delivered MW is the four-hour average injection of *energy* by the *generator-backed import contributors* in the *capacity auction capacity test*. If the PAF Delivered MW value is greater than 95% of the *generator-backed import resource's cleared ICAP*, then the PAF Delivered MW will be equal to 95% of the *cleared ICAP*.

Allowable Exceptions

The *IESO* will, if the circumstances permit, schedule a second testing window if a *generator-backed capacity import resource* is unable to complete the *capacity auction capacity test* during the entirety of the first two months of the *obligation period* in the following circumstances:

1. The *generator-backed capacity auction import resource* is unable to complete the *capacity auction capacity test* 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*.
2. The *generator-backed capacity auction eligible import resource* is unable to complete the *capacity auction capacity test* during the testing window due to a bona fide and legitimate reason as outlined in Ch. 7, Section 7.5.8A of the *market rules*. In such circumstances, the *capacity market participant* 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 the *IESO* has been notified and has approved the bona fide or legitimate reason.

Capacity Auction Dispatch Tests

(market rules: Ch. 7, ss. 19.4.11, 19.5.7, 19.7.7, 19.11.7)

The IESO may perform up to two *capacity auction dispatch tests* per *obligation period*. *Capacity auction dispatch tests* for all applicable *capacity auction resource* types will be scheduled for a duration of up to four hours within the *availability window* of the *dispatch day*.

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

Capacity auction dispatch tests for *capacity generation resources*, *capacity storage resources* and *capacity dispatchable loads* will be conducted as follows:

- The IESO will schedule a *capacity generation resource* or *capacity storage resource* to its *offer* amount in advance of the *capacity auction dispatch test* up to:
 - One hour for *capacity generation resources* that are *quick start facilities* and *capacity storage resources*.
 - One *business day* for *capacity generation resources* that are *non-quick start facilities* in the day-ahead timeframe and prior to the day-ahead commitment process.
- The IESO will schedule a *capacity dispatchable load* to reduce their energy withdrawal by an amount equal to at least its *demand response energy bid* up to one hour in advance of the *capacity auction dispatch test*.

If the *capacity auction resource* demonstrates it was able to follow its *dispatch instructions* within the applicable compliance dead band as per the Market Rule Interpretation Bulletin ([IMO MKRI 0001](#)), the test will be a pass. Otherwise, the test will be a fail.

In advance of the scheduled *capacity auction dispatch test* activation, if the *capacity market participant* is aware of a planned or *forced outage* that will make the *capacity auction resource* unable to comply with the *capacity auction dispatch test* in accordance with their *offered/bid* MW amount on the *dispatch day*, the *capacity market participant* shall notify the IESO about its inability to start and complete the dispatch test activation, according to the *outage* reporting requirements for the applicable *capacity auction resource* type as specified in “Market Manual 7.3: Outage Management” and update the *energy offers/bids* 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 resource being unable to deliver its *offered* MW amount during the *capacity auction dispatch test*.

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

Hourly Demand Response Resources

Capacity auction dispatch tests for *hourly demand response resources* will be conducted as follows:

- *Capacity market participants* with *hourly demand response resources* will receive a standby notice on the day prior to the *dispatch day* and an activation notice approximately 2 hours and

30 minutes in advance (but no later than 2 hours in advance) of the first *dispatch hour* of the *capacity auction dispatch test*. Resources will receive a schedule in pre-*dispatch* and real-time, regardless of the *demand response energy bid* price submitted.

If the *hourly demand response resource* being tested demonstrates a reduction of electricity withdrawal from the *IESO-controlled grid* equal to their *demand response energy bid* within a 15% dead-band for every *dispatch interval* for the duration of the test (up to 4 hours), the test will be a pass. Otherwise, the test will be a fail.

In advance of the *capacity auction dispatch test*, if the *capacity market participant* is aware of a non-performance event that will make the *hourly demand response resource* being tested unable to comply with the *capacity auction dispatch test* on the *dispatch day*, the *capacity market participant* shall manage its non-performance event as described in “Market Manual 7.3: Outage Management”. If the non-performance event indicates that the entirety of the *hourly demand response resource’s demand response energy bid* is unavailable, the *capacity auction dispatch test* will not be a failure and may be rescheduled by the *IESO* following the completion of the non-performance event.

An *hourly demand response resource’s capacity auction dispatch test* is considered valid, unless:

- The *capacity market participant* provides advanced notice to the *IESO* of a non-performance event, in accordance with Market Manual 7.3: Outage Management, that would reduce its *demand response energy bids* to 0 MW,
- The *IESO* did not send a standby or activation notification in advance of the test 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* shall inform *capacity market participants* with *hourly demand response resources* about the test cancellation.

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 *hourly demand response 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 *hourly demand response resource* audit will be conducted by evaluating each *demand response contributor* that is mapped to the selected Virtual C&I *hourly demand response 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 *hourly demand response resource*. All processes related to the virtual C&I *hourly demand response resource* audit will be managed through the Online IESO.

5.4.3 Audit Scheduling and Submission of Supporting Documents

The Virtual C&I *hourly demand response 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, including *demand response contributors* with a declared *contributor outage*. 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 5.3.3](#), including *demand response contributors* with a declared *contributor outage*. 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 this *market manual* 12.

5.4.4 Procedure to Conduct a Virtual C&I Hourly Demand Response Resource Audit

The Virtual C&I *hourly demand response resource* audit consists of two steps:

- **Step 1** of the audit reconciles actual *demand response contributor* measurement data to the *demand response contributors* LDC billing statement, and that declared *contributor outages* meet the requirements set out in section 19.4.10A of Ch. 7 of the *market rules*.
- **Step 2¹¹** 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

- Comparing the total kWh (energy) for a given month – Area under the curve
- 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 "Closed 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. An audit may be "Closed with Observations" if a *capacity market participant* has declared a *contributor outage* but the submitted *demand response contributor* meter data does not meet all the criteria as set out in section 19.4.10A of Ch. 7 of the *market rules*.

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.

Mechanism for Step 2 of the Audit Process

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

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

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:

- Virtual C&I *hourly demand response resource* audit is considered 'Complete' when
 - Contributors actual measurement data reconciles with associated LDC billing statement (tolerance of +/- 1%) and
 - Sum of actual measurement data reconciles with submitted measurement data (tolerance of +/- 1%)
- A Virtual C&I *hourly demand response 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 *capacity auction dispatch 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:

1. Availability requirements are not met (i.e. availability charge);
2. Measurement data submission was not accurate, timely or complete (i.e. administration charge);
3. *Dispatch instructions* were not followed (i.e. *dispatch* charge); and
4. Failing a *capacity auction capacity test* activation (i.e. capacity charge).

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

6.1 Non-Performance Factors

The *capacity auction* non-performance factors (CNPF) 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 –

Archive

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 request must be submitted to the IESO using Online IESO by the registered *capacity auction* contact. A separate request must be submitted for each *capacity obligation* and must contain the following information:

- 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 electrical 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. 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.

If the participant has requested a partial buy-out of its *capacity obligation*:

- The IESO will notify the *capacity auction participant* or *capacity market participant* of the revised *capacity obligation* and associated *cleared ICAP*. The *cleared ICAP* will be revised based on the *availability de-rating factor* applied at the time of the capacity qualification for the

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.

obligation period in which the partial buy-out is being completed, and pursuant to Ch. 7, s. 18.8 of the *market rules*

- 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, except in the case that a buy-out is associated with a *capacity obligation* for an *hourly demand response resource* for which *capacity auction capacity test* results are pending. In this circumstance, the *capacity prudential support* attributed to that *capacity obligation* will not be returned until the *capacity auction capacity test* results have been released and any in-period *cleared UCAP* adjustment charge settlement amount, calculated pursuant to section 4.7J.2.9 of Chapter 9, in relation to such *capacity auction capacity test*, has been received by the *IESO*. 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* and associated *cleared ICAP*. The *cleared ICAP* will be revised based on the *availability de-rating factor* applied at the time of the capacity qualification for the *obligation period* in which the transfer is being completed, and pursuant to Ch. 7, s. 18.8 of the *market rules*.

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 a reassessment of its *capacity auction deposit* and/or *capacity prudential support obligation*, if applicable, as specified in Section 3.4 and in "Market Manual 5.4: Prudential Support".

– End of Section –

This excel template is available in Online IESO under residential contributor management:

[illegible]

– End of Section –

Appendix B: Template for Measurement Data Control Sheet

This template is available in Online IESO.

[illegible]

– End of Section –

[illegible]

– 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 “ACCEPT” below, you attest to the following:

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

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

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

3. Such resource(s) 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 “ACCEPT” below, you attest to the following:

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

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

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

3. Such resource(s) 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*;
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 “ACCEPT” 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) meet(s) the definition of *system-backed capacity auction eligible import resource*. That definition reads as follows:

system-backed capacity auction eligible import resource means a *capacity auction resource* associated with a *boundary entity* that is available to qualify capacity that a neighbouring *control area operator* is willing to allocate to Ontario, if a *capacity obligation* is secured, for the duration of the applicable *obligation period*, which capacity would be deemed to be supplied from the entire system of the neighbouring *control area*. The allocated capacity must not otherwise be – in whole or in part – contracted to or otherwise obligated to be provided to the *IESO*, the *OEFC*, or 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 “ACCEPT” 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 *capacity auction participant* has confirmed with their host *control area operator* that the capacity being offered into the *capacity auction* can be removed from the host *control area's* resource adequacy processes in the planning and real-time timeframes for the applicable *obligation period(s)*;
3. The resource(s) which the *capacity auction participant* is submitting in the capacity qualification process meet(s) 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 qualify 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;

4. 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 –