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

Market Manual 12.0: Capacity Auctions



PUBLIC

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

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MANUAL

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

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 –

# Introduction

## Purpose

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

## Scope

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

* *Market participant* authorization as a *capacity auction participant*,
* Submission of a capacity qualification request by a *capacity auction participant*, determination of the amount of *unforced capacity (UCAP)* for each *capacity auction resource* by the *IESO*, and the submission of a *capacity auction deposit* by a *capacity auction participant*, ahead of an upcoming *capacity auction*,
* Submission of *capacity auction* *offers* by *capacity auction participants*,
* Processing of submitted *capacity auction offers* by the *IESO* and determining *capacity* *obligations*,
* Reporting of auction results and *capacity obligations* by the *IESO*,
* *Energy market* participation requirements*,*
* Testing of *capacity auction resources,* and
* *Settlement process* and *capacity* *prudential support obligations.*

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

This *market manual* points to other *market manuals* and *market rules* that provide additional information.

## 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 capacity to determine their *UCAP* ahead of a *capacity auction;*
* *Capacity auction participants* seeking to submit *capacity* *auction offers* into the *capacity auction*;
* *Capacity market participants* seeking to register *facilities* in order to meet their *capacity obligations* through the *energy market; and*
* *Capacity market participants* seeking to satisfy a *capacity obligation* by participating in the *energy market.*

## 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](mailto: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.

## Applicability

Pursuant to *market rules* Chapter 7, section 18.1A, a *market participant* that participates in a *capacity auction* will, until the end of that *capacity auction’s commitment period*, remain subject to those *market manual* provisions and corresponding *market rules* that were most recently in effect at the time of the holding of that *capacity auction* (except as provided by section 18.1A.3 in regards to *urgent amendments*). The versions of the *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*).

*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 –

# 

# 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.

## Capacity Auction Process

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

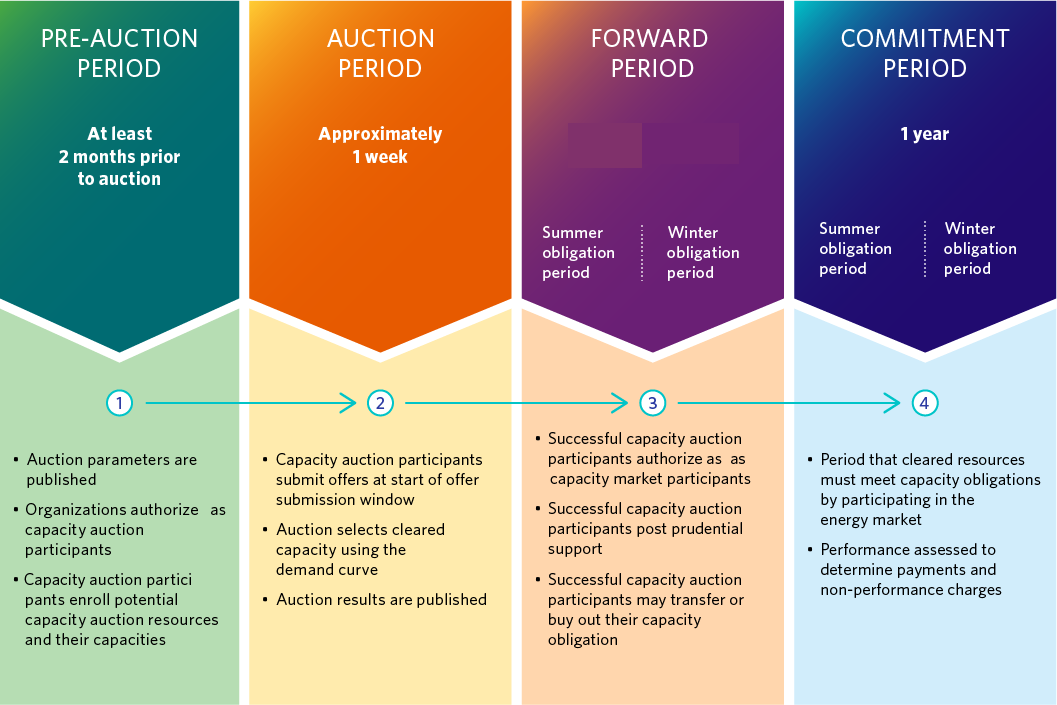


Figure 2-1: Capacity Auction Process

## 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 process for the *capacity auction.*
* *Market participants* intending to participate in the *capacity auction* must complete their authorization as a *capacity auction* *participant* in advance of initiating a capacity qualification request, and no later than 5 business days prior to the start of the qualification assessment window as specified in the pre-auction report
* During the qualification request submission window, *capacity auction participants* are required to submit a capacity qualification request identifying each potential *capacity auction resource,* and its corresponding *installed capacity (ICAP)* that they wish to have qualified in order to offer into the *capacity auction.*
* The *IESO* will complete an assessment to determine the *unforced capacity (UCAP)* for each potential *capacity auction resource,* and will notify *capacity auction participants* of this amount at the end of the qualification assessment window as specified in the pre-auction report.
* C*apacity auction participants* are required to submit the *capacity auction* *deposit* amount at least five *business days* prior to the start of the offer submission window for the *capacity auction*.
* The *capacity auction* will accept offers from *capacity auction participants* on the date announced in the pre-auction report, starting at 09:00 EST and ending on the next *business day* at 23:59 EST. This period is referred to as the 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 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.

## Commitment Periods and Obligation Periods

The c*ommitment 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 following 3 *business days* after the *auction period*, to the commencement of an *obligation period.* The length of the *forward period* will vary depending on the date of a *capacity auction* relative to its *obligation period*.

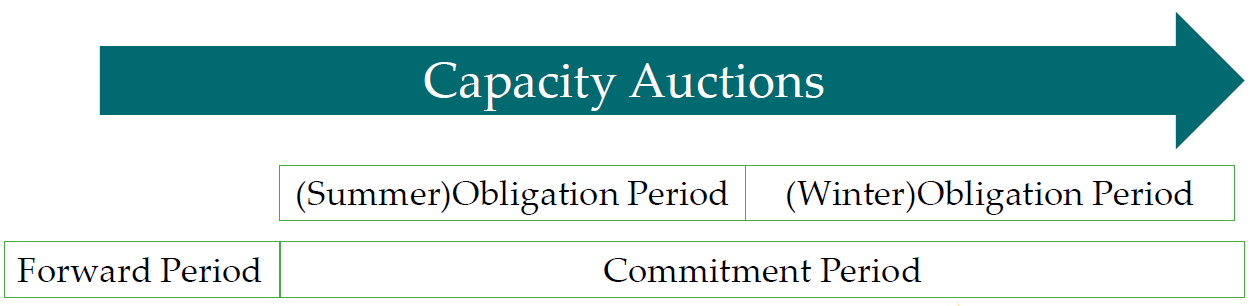


Figure 2-3: Periods of time related to *capacity auctions*

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

## 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*.

## Demand Curve Elements

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

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

* Target capacity
* Reference price
* Maximum and minimum auction clearing prices
* Capacity limits

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



Figure 2-4: Downward Sloping Demand Curve

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

### 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.

### Reference Price

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

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

### Maximum and Minimum Auction Clearing Price

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

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

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

### 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:

Where:

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

The maximum capacity is the maximum amount of *auction capacity* which the *IESO* will clear through the auction. The maximum capacity is determined by forming a straight line between the points defined by the maximum capacity at the maximum *capacity auction* *clearing* *price* and the *target capacity* at the *capacity auction reference price,* and extending this line to the price of $0/MW-day. The capacity limits for each *obligation period* shall be *published* by the *IESO* in the pre-auction report.

## Zonal Constraints

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

Each electrical zone has a set of *capacity auction zonal constraints* defined. These include

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

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

* minimum amount of *auction* *capacity* to be acquired
* total maximum amount of *auction capacity* that can be acquired

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

## Capacity Import Constraints

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

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

* maximum amount of *auction capacity* that may be provided by all  *system-backed capacity import resources* and *generator-backed capacity import resources.* When this constraint is binding it will not determine the *capacity auction clearing price,* and
* maximum amount of *auction capacity* that may be provided by all *system-backed capacity import resources* or *generator-backed capacity import resources* at each external interface.When this constraint is binding it will not determine the zonal *capacity auction clearing price* or zone group *capacity auction clearing price.* External interfaces not listed in the pre-auction report indicate that they border upon a jurisdiction where there is no associated agreement between the relevant balancing authorities[[1]](#footnote-3).

*system-backed capacity import resources* and *generator-backed capacity import resources* will be subject to the zonal constraints in the external interface’s bordering electrical zone, as described in [Section 2.6](#_Zonal_Constraints). As such, there will be no price separation for  *either system-backed capacity import resources* or *generator-backed capacity import resources,* and the resources located within Ontario’s electrical zone the interface borders. The *IESO* shall *publish* capacity import limits in the pre-auction report.

**– End of Section -**

# 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](#_Pre-Auction_Reporting_Obligations) 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 in below.

## Pre-Auction Report

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

Prior to the *capacity auction*, the *IESO* shall *publish* a pre-auction report to include the following reference points, for both *obligation period*s:

* *Target capacity*
* *Capacity auction reference price*
* Minimum and maximum *capacity auction clearing prices*
* Minimum and maximum *auction capacity* to be secured
* Maximum *auction capacity* to be secured at the maximum *capacity auction clearing price*
* Zonal constraints for each electrical zone and zone groups, as explained in [Section 2.6](#_Zonal_Limitations) of this manual
* Capacity import constraints as explained in Section 2.7 of this manual

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

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

## Participant Authorization

(Market Rules: Chapter 2, section 2.1.1.1.11 and 2.1.1.1.12)

All prospective participants who wish to submit a capacity qualification request to participate in the *capacity auction* are required to authorize as *capacity auction participants* 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*

## Capacity Qualification

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

This section provides additional details with respect to the submission of a capacity qualification request by a *capacity auction participant* who wishes to participate in a given *capacity auction,* as well as the methodology the *IESO* uses to determine the *unforced capacity (UCAP)*, in accordance with Chapter 7, sections 18.2 and 18.2A.

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

* the submission of a capacity qualification request including any additional data that’s required based on the *capacity auction resource* type as outlined in section 3.3.1 of this manual, and
* The *IESO* assessment of the potential *capacity auction resources’ unforced capacity (UCAP)* using the formulas outlined in this section .

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

### Submission of a Capacity Qualification Request

(Market Rules: Chapter 7, section 18.2.1.2)

Prior to the deadline specified in the pre-auction report, authorized *capacity auction participants* wishing to participate in an upcoming *capacity auction* are required to submit to the *IESO*, via Online IESO[[2]](#footnote-4), the following information as part of a capacity qualification request:

* The *ICAP* for each potential *capacity auction resource.*
  + Additional information required to determine the *ICAP* for *capacity auction eligible storage resources* is outlined in Table 1-1
  + For *generator-backed capacity auction eligible import resources* the *ICAP* must be provided for each *generation unit* and *storage unit* associated with the *generator-backed capacity auction eligible import resource*
* The *obligation period(s)* for which they may wish to submit *capacity auction offers*. Participants may choose to submit *capacity auction offers* for one or both *obligation periods*,
* The type of *capacity auction resource* that will satisfy a *capacity obligation* during the *commitment period* and for *HDR resources,* the obligation type (e.g. physical or virtual) and contributor type (e.g. Residential or Commercial & Industrial)*.* Refer to [Section 5.3.2](bookmark://_Settlements) for details on submitting *demand response contributor* data information.

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

Table 1-1: Additional information required for submission of a capacity qualification request by *capacity auction resource* type.

|  |  |
| --- | --- |
| Capacity Auction Resource Type | Additional Information Required |
| *Capacity generation resources* | * The *registered facility* and associated resource that will satisfy the *capacity obligation* * A signed attestation declaring that the *generator* that will deliver *auction capacity* meets the requirements of a *capacity auction eligible generation resource* as set out in Chapter 11, Definitions of the *market rules* |
| *Capacity storage resources* | * The temperature-sensitive maximum power rating of the resource that can be sustained for 1 hour (Full Power Operating Mode) * The temperature-adjusted maximum amount of energy in MWh (Energy Rating), that the resource is capable of delivering when it is fully charged   + The Full Power Operating Mode and Energy Rating will be used to determine the ICAP of a *capacity storage resource* using the following formula:   ICAP = [min (Full Power Operating Mode, Energy Rating/4 hours)]   * The *registered facility* and associated resource that will satisfy the *capacity obligation* * A signed attestation declaring that the *generator* that will deliver *auction capacity* meets the requirements of a *capacity auction eligible storage resource* as set out in Chapter 11, Definitions of the *market rules* |
| *Capacity dispatchable load resources* | * The *registered facility* and associated resource that will satisfy the *capacity obligation* * If there is no *registered facility,* the zonal location of the potential *capacity dispatchable load resource.* Participants may choose from the ten electrical zones to submit *capacity auction offers* |
| *System-backed capacity import resources* | * The external interface that will be used to deliver the *auction capacity* * A signed attestation acknowledging that all eligibility requirements have been met*,* as set out in Chapter 11, Definitions of the *market rules* and that has taken such actions 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) will remove any MW related to a *capacity obligation* associated with from its adequacy assessments |
| *Generator-backed capacity import resources* | * The external interface that will be used to deliver the *auction capacity* * A signed attestation acknowledging that all eligibility requirements have been met, as set out in Chapter 11 of the *market rules,* that the *capacity auction participant* is the owner of the potential *capacity auction resource*, and proof of deliverability to the Ontario border in one of the following forms:   + For *generator-backed capacity auction eligible import resources* located within the New York Independent System Operator (NYISO) *control area*, proof that the resource holds Capacity Resource Interconnection Service (CRIS) status; or   + For *generator-backed capacity auction eligible import resources* located within the Hydro Quebec *control area*, confirmation of firm transmission service from the transmission operator   In addition, for each *generation unit* associated with a *generator backed-capacity import resource*, the following must be submitted*:*   * The accredited *UCAP* rating as provided from an external jurisdiction * The fuel type * The resource name * The unique numeric identifier for the *generator-backed capacity auction eligible import resource*   For each *storage unit* associated with a *generator backed-capacity import resource*, the following must be submitted*:*   * The temperature-sensitive maximum power rating of the resource that can be sustained for 1 hour (Full Power Operating Mode) * The temperature-adjusted maximum amount of energy in MWh (Energy Rating), that the resource is capable of delivering when it is fully charged   + The Full Power Operating Mode and Energy Rating will be used to determine the ICAP of a *capacity storage resource* using the following formula:   ICAP = [min (Full Power Operating Mode, Energy Rating/4 hours)]   * The resource name * The unique numeric identifier for the *generator-backed capacity auction eligible import resource* |
| *Hourly demand response (HDR) resources* | * The *registered facility* and associated resource that will satisfy the *capacity obligation* * If there is no *registered facility,* the zonal location of the potential *demand response resource* and/or *demand response contributors* for which they are willing to submit offers, the obligation type (physical or virtual) and contributor type (Residential or Commercial & Industrial) |

### Capacity Qualification Assessment

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

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

* Verify that the *market participant* has completed the pre-auction authorization process to become a *capacity auction participant* as outlined in 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 maximum amount of *UCAP* that each *capacity auction resource* can offer into the *capacity auction* for one or both of the summer and winter *obligation periods*.
  + For *generator-backed capacity auction eligible import resources,* the *IESO* will assess the *UCAP* for each *generation unit* associated with the *generator-backed capacity auction eligible import resource* and provide a single *UCAP* that the *capacity auction resource* can offer into the auction. The single *UCAP* will be equal to the sum of each individual resource’s *UCAP.*

The approach for determining the maximum *UCAP* for all *capacity auction resource* types can be generalized as follows:

*UCAP* = *ICAP* x Availability De-Rating Factor x (1 – PAF)

Where:

* Availability De-Rating Factor reflects a resource’s historic availability and is calculated for each *capacity auction resource* type as specified in table 1-2
* PAF is the Performance Adjustment Factor which reflects performance during a capacity test activation in a historic obligation period, and will be calculated as specified in table 1-2

Table 1-2: Availability De-Rating Factors and Performance Adjustment Factors by *capacity auction resource* type

| **Capacity Auction Resource Type** | | **Availability De-Rating Factor** | **Performance Adjustment Factor (PAF)** |
| --- | --- | --- | --- |
| *Capacity generation resources* | Dispatchable Thermal | Availability De-Rating Factor= EFORd  Where:  EFORd is the equivalent forced outage rate on demand based on 5 years of historic data.  For *capacity generation resources* with less than 5 years of historical data, a proxy value of 7% will be used based on the median EFORd of Ontario’s natural gas fleet[[3]](#footnote-5) | The PAF will be calculated according to the formula in [Section 5.3 (Capacity Auction Capacity Tests)](#_Capacity_Auction_Capacity), and will be based on the resource’s historical performance in a *capacity auction capacity test* in the most recent *obligation period* for which data is available, starting from the *obligation periods* associated with the 2022 *capacity auction.* |
| Dispatchable Hydro | Availability De-Rating Factor= Median of [(AQEI (MWh)+Scheduled Operating Reserve (MWh))/MAPC] in Top 200 hours of Ontario demand per season for the last 5 years  Where:   * AQEI is the Allocated Quantity of Energy Injected, in MWh * Scheduled OR is the Scheduled Operating Reserve in MWh * MAPC is the Maximum Active Power Capability, in MW, under any conditions without station service being supplied by the unit   For *capacity generation resources* with less than 5 years of historical data, the median value for the zone will be used. Where there is no dispatchable hydro generation in a zone, an Ontario-wide median will be used. |
| *Capacity storage resources* | | Availability De-Rating Factor = EFORd  Where:  EFORd is the equivalent forced outage rate on demand and is set at 5% |
| *Capacity dispatchable load resources* | | Availability De-Rating Factor = Median(hourly bids quantity/maximum seasonal energy bid quantity) in top 200 hours of Ontario demand per season  For new *capacity dispatchable load resources,* a fleet specific class median will be applied |
| *Generator-backed capacity import resources* |  |  |
| Dispatchable Thermal | Not applicable. The availability de-rate factor is accounted for in the accredited UCAP rating from an external jurisdiction. |
| Dispatchable Hydro | Not applicable. The availability de-rate factor is accounted for in the accredited UCAP rating from an external jurisdiction. |
| Dispatchable Storage | Availability De-Rating Factor = EFORd  Where:  EFORd is the equivalent forced outage rate on demand and is set at 5% |
| *Hourly demand response (HDR) resources* | | Not applicable |
| *System-backed capacity import resources* | | Not applicable | Not applicable |

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

Any *capacity auction resource* assessed to have a *UCAP* below 1MW will be unable to participate in the *capacity auction*. For *generator-backed capacity auction eligible import resources,* any *generation unit* or *storage unit* associated with the *generator-backed capacity auction eligible import resource* that is assed to have a *UCAP* below 1 MW will be unable to participate as part of the *generator-backed capacity auction eligible import resource* in the *capacity auction.*

## Capacity Auction Deposit

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

Following receipt of the *unforced capacity (UCAP)* from the *IESO*, all *capacity auction participants* wishing to submit *capacity auction offers* into the *capacity auction* are 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 market participant* for auction activities. The pre-auction deposit is also intended to ensure that the *capacity auction participant* fulfills any post-auction and *forward period* obligations.

The *IESO* will calculate the *capacity auction deposit* amount that a *capacity auction participant* is required to submit for each *obligation period*, based on the  *UCAP* determined for each *capacity auction resource* and in each *obligation period* of the *capacity auction*.

The formula for calculating a *capacity auction participant’s* deposit amount in a *capacity auction* is as follows:

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

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

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

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

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

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

*Capacity auction deposits* by cash may be submitted by *electronic funds transfer* to an *IESO*-designated account.

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

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

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

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

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

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

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

– End of Section –

# Auction Mechanics

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

Stage 1. Offer Submission and Validation: the Capacity Auction Participant submits offers and the IESO Validates those offers.
Stage 2. Auction Clearing: the IESO determines Clearing Price/Quantity, resolves any ties, and determines capcaity obligations.
Stage 3. Post-Auction Reporting Obligations: the IESO prepares and publishes the post-auction reports.

Figure 4-1: Capacity Auction Mechanics Overview

## Stage 1: Offer Submission and Validation

*Capacity auction participants* are required to submit *capacity auction offers* via Online IESO, following the auction timelines detailed in [Section 2](#_Transitional_Capacity_Auction).2 of this *market manual*. Each *capacity auction participant* may submit c*apacity 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 (UCAP)* determined by the *IESO* during the pre-auction process, 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 *UCAP* for the potential *capacity auction resource*. The *capacity auction offer* quantity must increase with every new lamination added to an offer set (Ch.7, S. 18.6.3.2 of the *market rules*).

A *capacity auction participant* may revise a *capacity auction offer* in Online IESO up until the *capacity auction offer* window closes, per the timelines detailed in [Section 2](#_Capacity_Auction_Timelines).2 of this *market manual*.

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

*A capacity auction offer* must also specify, for each *price-quantity pair*, whether the entire *auction capacity* represented in the lamination must be cleared in full or whether it may be partially cleared (Ch.7, S. 18.6.3.4 of the *market rules*). A full flag indicates to the *IESO* that the *capacity auction participant* is only willing to clear the auction with the full amount of *auction* *capacity* offered in that lamination. A partial flag indicates to the *IESO* that the *capacity auction participant* is willing to clear the auction in 0.1 MW increments of the offer in that lamination.

The participant must be ready to provide *auction capacity* in the amount of their *capacity obligation* by the first day of the *obligation period* or be subject to non-performance charges as explained in [Section 6](#_Settlements_1) of this *market manual*.

## Stage 2: Auction Clearing

Once the *capacity auction offer* submission window closes, the *IESO* will review all *capacity auction offers* to determine the *capacity auction clearing price* for each zone, as per the timelines detailed in [Section 2](#_Demand_Response_Auction_1) of this *market* *manual*.

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

The *IESO* will consider all *capacity auction offers* and clear them against a downward-sloping demand curve, utilizing an optimization model to maximize the social welfare (i.e. the area under the demand curve less supply costs). This clearing process will respect all *capacity auction zonal* *constraints* and capacity import constraints. The clearing process will determine the *capacity auction clearing price* for each zone. When there is a *capacity auction offer* not selected, either partially or in full, due to the totalmaximum *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 clearing price for all zones incorporated in that group 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 totalmaximum *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 totalmaximum *capacity auction zonal constraint*. If the auction engine determines that the un-cleared quantity from the second offer in Zone 1 would have cleared but for the total maximum *capacity auction zonal constraints*, a zonal *capacity auction clearing price* will be determined, in the manner described above. The overall procurement will continue and the *capacity auction offers* will clear until the intersection with the demand curve at 340 MW, which will also set the *capacity auction clearing price* for Zone 2 & 3, and is also referred to as the Ontario-wide *capacity auction clearing price*.

If the *IESO* receives two or more *capacity auction offers* at the same price for the last available quantity, the *capacity auction offer* with the earlier time stamp[[4]](#footnote-6) shall be selected as the successful *capacity auction offer* (Ch.7, S. 18.7.5 of the *market rules*).

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

## Stage 3: Post-Auction Reporting Obligations

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

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

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

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

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 –

# Post-Auction Requirements

## Participant Authorization

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

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

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

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

### Prudential Support

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

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

## Registration Requirements

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

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

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

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

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

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

**Physical Demand Response Resource**

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

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

**Virtual Demand Response Resource**

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

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

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

### Contributor Management

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

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

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

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

There are two categories of *demand response contributors* that can be registered to meet a *capacity obligation*:

1. Virtual *HDR* *resources* consisting of commercial, industrial, institutional and/or *non-dispatchable loads* (C&I) that can be classified as:
   1. Virtual C&I HDR contributors; and
   2. Physical C&I HDR contributors;
2. Virtual *HDR* *resources* consisting of residential[[5]](#footnote-7) smart-metered loads that can be classified as:
   1. Virtual residential HDR contributors

**Virtual C&I HDR Contributors registration requirements:**

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

1. 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*;
2. Applicable licensed Local Distribution Company (LDC) name, and LDC account number indicated on the *demand response contributors*’ LDC billing statement;
3. *Demand response contributor* load class type (i.e., industrial, commercial, and/or institutional);
4. Whether the demand response is to be provided via load interruption or behind-the-*meter* generation;
   * If demand responsetype 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;
5. Identification of whether the *demand response contributor* is participating in other demand response or conservation initiatives;
6. *Demand response capacity* of contributor in MW;
7. 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*;
8. Data acquisition method used to collect *demand response contributor* *meter* data;
9. Submission of LDC Billing statement for each LDC meter installation that is issued within three months of the *demand response contributor* effective date;
10. Submission of single line diagram (SLD) is required when the *demand response resource* type is behind-the-*meter* generation. SLD submissions (at a minimum) must include the following details:
    * Facility/contributor name, physical address
    * Embedded connection point(s) (point of sale) to the local distribution company (LDC)
    * Location of distribution transformer
    * Location of breakers, disconnect switches, etc.
    * Location of the metering installation and meter point reference identification (as indicated on contributors’ Record of Installation)
    * If behind-the-meter generation, indicate generation location and nameplate information (MVA/kVA rating, output voltage)

**Physical C&I HDR Contributors registration requirements:**

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

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

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

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

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

**Virtual Residential HDR Contributors registration requirements:**

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

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

1. *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;
2. Applicable licensed Local Distribution Company (LDC) name and LDC account number indicated on contributors’ LDC billing statement;
3. Indicator flagging the control group *demand response contributor*s, as defined in the section entitled “Randomized Control Trial Baseline Methodology” below, where there must be at least 350 control group *demand response contributor*s 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 contributor*s under the residential *HDR resource*;

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

1. *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);
2. Total number of *demand response contributor*s in the treatment group as defined in the section entitled “Randomized Control Trial Baseline Methodology” below; and
3. Total number of *demand response contributor*s in the control group.

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

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

**Randomized Controlled Baseline Methodology**

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

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

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

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



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

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

## 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 6.3.3](bookmark://_Testing_of_Capacity). *Capacity market participants* with *capacity obligation(s)* allocated to *HDR resources* will be compensated for out of market activations, including *capacity auction dispatch test activations*, as detailed in “Market Manual 5.5: Physical Markets Settlement Statements.”

### Outage Management/ Non-Performance Events

*Capacity market participants* with a *capacity auction resource*, except for *capacity market participants* with *system-backed capacity import resources,* are required to submit *outage* requests as set out in “Market Manual 7.3: Outage Management.” *Capacity market participants* with *HDR resources* are required to inform the *IESO* of non-performance events[[6]](#footnote-8)as set out in Market Manual 7.3.

### Measurement Data Submissions

**For Virtual C&I *HDR resource* (s):**

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

Processing of Measurement Data

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

* Virtual *demand response contributors* with a uni-directional meter type, the uni-directional interval meter readings will be recorded in the summation of Channel 1 (kWh delivered) energy quantities. Channel 2 (received) energy is recorded as zero for that *demand response contributor*
* Virtual *demand response contributors* with a bi-directional meter type, the *demand response contributor*’s bi-directional interval meter readings must be netted (kWh delivered – kWh received) and recorded as follows:
  + if the resultant net kWh quantity is less than or equal to zero, then the total net kWh value will be zero and is recorded in the summation of Channel 1 (delivered) energy quantity for that interval. Channel 2 (received) energy is recorded as zero for that interval, or
  + if the resultant net quantity is greater than zero, then the total net value will be equal to the net amount and will be included in the summation of Channel 1 (delivered) energy quantity for that interval. Channel 2 (received) energy is recorded as zero for that interval

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

File Format Requirements for Measurement Data Submissions

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

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



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

**For Virtual Residential *HDR resource* (s):**

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



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

Timelines for Data Submission and Processing

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

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

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

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

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

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

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

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

### Testing of Capacity Auction Resources

#### Capacity Auction Capacity Tests

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

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

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

To execute a *capacity auction capacity test,* the *IESO* will determine a 5-*business day* window (“testing window”) for each *obligation period* within which applicable *capacity auction resources* will be required to ensure they are scheduled in the *energy market* for a resource-specific amount of time within the applicable *availability window*. The *IESO* will issue an advisory notice indicating when the testing window will be scheduled, a minimum of 5 *business days* in advance of the testing window.

Ca*pacity auction capacity tests* for these *capacity auction resources* are conducted as follows:

* *Capacity auction resources* must submit energy market bid/offer prices to ensure they receive a generation (for generators and storage) or load curtailment (for dispatchable load and HDR) schedule/activation in the *energy market* to the greater of their *cleared ICAP* or their *minimum loading point* (for *capacity generation resources*) during the testing week within the *availability window* for the following durations:
  + *Capacity generation resources (quick start* andnon-*quick start* generators), *capacity storage resources*, and *hourly demand response resources (HDRs)* – 4 consecutive hours
  + *Capacity dispatchable loads* – 3 *dispatch intervals*

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

* *Capacity market participants* must notify the *IESO*, no later than 5 *business days* after the end of testing window, of the specific day, hours and *dispatch intervals*, if applicable, for which they wish their performance to be assessed.

Failure of a *capacity market participant* to notify the *IESO* by the deadline may result in non-performancecharges as specified in “Market Manual 5.5: Physical Markets Settlement Statements”.

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

* The *capacity auction capacity test* will be deemed a pass if the *capacity auction resource* delivered, on average for its specified test duration, its *cleared ICAP* within the specified threshold of 10% for *HDR resources* and 5% for all other resource types.
* If the test is deemed a pass, the Performance Adjustment Factor (PAF) applied to the *capacity auction resource* in the next future *capacity auction* in which it participates will be 0.

Failure of the *capacity auction capacity test* will result in the applicable non-performance chargesas specified in “Market Manual 5.5: Physical Market Settlements”. The PAF to be applied to the next future *capacity auction* in which the *capacity auction resource* participates will be calculated according to the formula below:

PAFsummer or winter = 1 – (delivered MW/*cleared ICAP)*

Where:

Delivered MW is equal to the average amount of *auction capacity* delivered by the *capacity auction resource* over its specified test duration.

If data is missing to calculate the “delivered MW” (i.e. the *capacity market participant* did not notify the *IESO* of the completed *capacity auction capacity test* by the deadline), then the “delivered MW” will be set at 75% of the *capacity auction resource’s* *cleared ICAP*.

Generator-Backed Capacity Import Resources

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

* Submit data to the *IESO* confirming the capability of all *generation units* and *storage units* associated with the *generator-backed capacity import resource* to inject, in aggregate, the *generator-backed capacity import resource’s* *cleared ICAP* into the grid of the host *control area* in which it is located for 4 consecutive hours within the *availability window*, on a date that falls within the first two months of the applicable *obligation period*, and
* Successfully schedule an import transaction at the *cleared ICAP* from the host *control area* into Ontario at the relevant intertie for at least 1 hour that coincides with the timing of the scheduled 4-hour activation in the host *control area* being used to confirm capability of the *generator-backed capacity import resource*.

**Data Submission Requirements**

The data submission must consist of revenue-grade quality meter data that meets the market participation requirements of the host *control area operator* in which it is located. The data shall be provided on a 5-minute interval basis and shall be verified as complete and accurate by the host *control area operator*. The data submission must be sent to capacity.auction@ieso.ca.

**Timelines for Data Submission and Processing**

The data set must be provided to the *IESO* no later than the sixth (6th) *business day* before the end of the month following the month in which the monthly data set relates. The *IESO* will review all data submissions and respond to the *capacity market participant* with notice of any errors or clarifications by the fourth (4th) *business day* before the end of the month following the month in which the data set relates. The *capacity market participant* will then have (a minimum of) 2 *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-performancecharges 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 following parameters:

* If the *generator-backed capacity import resource* demonstrates, through their data submission, an injection of electricity into the host *control area’s* grid equal to their *cleared ICAP* within a threshold of 5%for 4 consecutive hours within the required date and time, and successfully scheduled the corresponding import for its *cleared ICAP* into Ontario for at least 1 hour during the same time period, the test will be deemed a pass.
* If the test is deemed a pass, the Performance Adjustment Factor (PAF) applied to the *capacity auction resource* in the future auction will be 0.
* Failure of the *capacity auction capacity test* will result in the applicable non-performance charges as specified in “Market Manual 5.5: Physical Market Settlements”. The PAF (specific to winter/summer) will be applied to the future capacity auction qualification, and will be calculated using the following formula:

PAFsummer or winter = 1 – (delivered MW/*cleared ICAP)*

Where:

Delivered MW is equal to the average amount of *auction capacity* delivered over the entire duration of the test, which in the case of *generator-backed capacity import resources* would be the average MW output of the *generation units* and *storage units* associated with the *generator-backed capacity import resource* in the host *control area* over the course of the test hours as specified by the *capacity market participant*.

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

System-Backed Capacity Import Resources

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

The tests are conducted as follows:

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

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

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

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

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

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

#### Capacity Auction Dispatch Tests

The *IESO* reserves the right to perform up to two *capacity auction dispatch tests* per *obligation period* to validate a *capacity auction resource*’s ability to deliver their scheduled capacitywith minimal notice. *Capacity auction dispatch tests* for all applicable *capacity auction resource* types will be scheduled for a duration of up to 4 hours within the *availability window* of the *dispatch day*.

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

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

The *IESO* may schedule a *capacity auction dispatch test* for a *capacity auction resource* regardless of whether the above conditions are met, if there is evidence that the *capacity auction resource* is not able to follow *dispatch instructions* at any time during the *obligation period*.

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

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

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

*Capacity auction dispatch tests* for these *capacity auction resources* will be conducted as follows:

* The IESO will apply a constraint to the resource’s offer MW amount in advance of the *capacity auction dispatch test* up to:
  + 1 hour for *capacity generation resources that are quick start generators and capacity storage resources*.
  + 1 *business day* for *capacity generation resources* that are non-*quick start* generators in the day-ahead timeframe and prior to the day-ahead commitment process.
* *Capacity dispatchable loads* will have a constraint applied to curtail up to their bid MW amount up to 1 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](https://www.ieso.ca/-/media/Files/IESO/Document-Library/mr-interpret-bulletin/ib_IMO_MKRI_0001.ashx)), the test will be deemed a pass.

If the *capacity auction resource* is unable to comply with the *capacity auction dispatch test* in accordance with their offered/bid MW amount on the *dispatch day*, it is the responsibility of the *capacity market participant* to notify the *IESO*, 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”. A subsequent *capacity auction dispatch test* may be rescheduled by the *IESO* following the completion of the *outage*.

Hourly Demand Response Resources

*Capacity auction dispatch tests* for *HDR resources* are conducted as follows:

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

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

If the *HDR resource* being tested is unable to comply with the *capacity auction dispatch test* on the *dispatch day*, it is the responsibility of the *capacity market participant* to manage its non-performance as described in “Market Manual 7.3: Outage Management”. If the non-performance event indicates that the entirety of the *HDR resource’s demand* *response energy* *bid* is unavailable, a subsequent *capacity auction dispatch test* may be rescheduled by the *IESO* following the completion of the non-performance event.

An *HDR resource’s* *capacity auction dispatch test* is considered valid, unless:

* The *capacity market participant* provides notice of a non-performance event that would reduce its *demand* *response energy* *bids* to 0 MW,
* The *IESO* did not send either a standby or activation notifications 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* will appropriately inform *capacity market participants* with *HDR resources* about the test cancellation.

**Performance Parameters:**

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

Performance will be assessed using the following parameters:

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

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

## Measurement Data Audit for Virtual HDR Resources

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

### Capacity Market Participant’s Responsibilities

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

The *capacity market participant* is responsible for:

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

### Virtual C&I *HDR Resource* Audit

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

### Audit Scheduling and Submission of Supporting Documents

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

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

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 contributor*s registered under the *capacity market participant’s* portfolio. This information will be used by the *IESO* auditor to verify:

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

**Measurement Data**

The *capacity market participants* are required to provide the *IESO* with individual *demand response contributor* *meter* data as explained in [section 5.3.2](#_Settlements). 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 data[[7]](#footnote-11) for the audit month and an additional two months of baseline.
* Actual measurement data[[8]](#footnote-12) meets the criteria defined in [Section 5.4.4](#_Procedure_to_Conduct) of the document.

### Procedure to Conduct a Virtual C&I HDR Audit

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

1. **Step 1** of the audit reconciles actual *demand response contributor* measurement data to the *demand response contributor*s LDC billing statement
2. **Step 2[[9]](#footnote-13)** of the audit reconciles the sum of the *demand response contributor*’s actual measurement data to the submitted measurement data (this is the measurement data provided by the *capacity market participant* during activation months in accordance with the Demand Response Measurement Data Submission Timelines).

**Mechanism for Step 1 of the Audit Process**

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

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

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

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

**Mechanism for Step 2 of the Audit Process**

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

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

### Audit Review and Remedial Actions

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

### Closure of Audit

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

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

– End of Section –

# Settlements

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

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

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

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* (i.e. capacity charge).

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

## Non-Performance Factors

The non-performance factors referenced in Market Manual 5.5 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 |
| December | 1.5 |

– End of Section –

# Buy-out Process

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

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

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

* Capacity obligation ID;
* Effective date of the buy-out request[[10]](#footnote-14);
* Buy-out *obligation period*: Specify the *obligation period* the buy-out is being requested for;
* Buy-out zone;
* *Capacity auction resource;* and
* Buy-out capacity: Specify the capacity of the buy-out request in MW, to one decimal place. In the case of a partial buy-out request, the remaining *capacity obligation* must be greater than or equal to 1 MW. In the case of a full buy-out request, the remaining *capacity obligation* must be 0 MW.

The *IESO* will process the buy-out request within seven *business days.* At the end of this review period, the *IESO* will either:

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

OR

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

The buy-out takes effect upon the IESO’s communication to the participant confirming that the buy-out request has been approved. For greater clarity, a participant should not begin adjusting their energy market bids in advance of receiving the IESO’s approval otherwise they may be subject to non-performance charges as specified in Market Manual 5.5: Physical Market Settlements.

– End of Section –

# Capacity Obligation Transfer

*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* ofany additional *capacity auction deposit* or *capacity prudential support obligation*, as required*.*

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

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

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

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

– End of Section –

Appendix A: Template for DR Residential Contributor Management Registration

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Contributor Address** | **LDC Name** | **LDC Account#** | **Control Group Flag (Y/N)** |
| *(Street # & Name, City, Province, Postal Code)* |  |  |  |
| *E.g. 123 Street Ave, Toronto, ON, L5C 2B3* |  |  |  |
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– End of Section –

Appendix B: Template for Measurement Data Control Sheet

This template is available in Online IESO.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Resource ID** | **Contributor ID** | **Contributor Name** | **Commitment Month** | **Time Interval for which data was estimated** |
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References

| Document ID & Link | Document Title |
| --- | --- |
| [MDP\_RUL\_0002](http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-rules/guidetodocsinbaseline.pdf) | Market Rules for the Ontario Electricity Market |
| [IMP\_GDE\_0088](http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-manuals/connecting/pki-ops-guide.pdf) | Market Manual 1.3: Identity Management Operations Guide |
| [PRO-408](http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-manuals/connecting/market-registration.pdf) | Market Manual 1.5: Market Registration Procedures |
| [MDP\_PRO\_0027](http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-manuals/market-operations/mo-dispatchdatartm.pdf) | Market Manual 4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets |
| [IMP\_PRO\_0034](http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-manuals/market-operations/mo-RealTimeScheduling.pdf) | Market Manual 4.3: Real-Time Scheduling of the Physical Markets |
| [MDP\_PRO\_0045](http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-manuals/settlements/se-PrudentialSupport.pdf) | Market Manual 5.4: Prudential Support |
| [MDP\_PRO\_0033](http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-manuals/settlements/se-rtestatements.pdf) | Market Manual 5.5: Physical Markets Settlements Statements |
| [IMP\_PRO\_0035](http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-manuals/system-operations/so-outagemanagement.pdf) | Market Manual 7.3: Outage Management |
| [IESO\_MAN\_0077](http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-manuals/day-ahead-commitment/SubmittingOperationalAndMarketData.pdf) | Market Manual 9.2: Submitting Operational and Market Data for the DACP |

 End of Document 

1. Agreements between the relevant balancing authorities will, at a minimum set out requirements for firm transactions and confirmation that capacity transacted as a result of a capacity auction will be coordinated between the balancing authorities (e.g. removed from applicable adequacy assessments). [↑](#footnote-ref-3)
2. 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/). [↑](#footnote-ref-4)
3. Median EFORd of Ontario’s natural gas fleet excluding Lennox Generating Station. [↑](#footnote-ref-5)
4. A time stamp refers to the time recorded by Online IESO when a *capacity auction participant* submits or revises an offer during the 2-*business day* offer submission window. [↑](#footnote-ref-6)
5. A 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. [↑](#footnote-ref-7)
6. Non-performance event means an event determined by the *CMP* where a *demand response resource* is, in whole or in part, in a Demand Response *Outage* or otherwise unable to Curtail for a period of time. [↑](#footnote-ref-8)
7. Submitted measurement data refers to the monthly Data submissions for the DR Resource in accordance with the Demand Response Submission Timelines. [↑](#footnote-ref-11)
8. Actual contributors’ measurement data refers to the individually submitted Contributor Data through the DR Audit task in Online IESO. [↑](#footnote-ref-12)
9. If a partial audit is conducted, the actual measurement data will only be assessed using Step 1 of the audit process. [↑](#footnote-ref-13)
10. 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.* [↑](#footnote-ref-14)