
Capacity Auction #2

Design of the Auction to be held in March 2021

[DRAFT FOR STAKEHOLDER COMMENT]

MARCH 5, 2020

Executive Summary

Continuing the Capacity Auction evolution: leveraging competition to address future supply needs today

Every minute of every day, the Independent Electricity System Operator (IESO) ensures the reliability and efficiency of the province's electricity system. The IESO provides Ontarians with the power they need when they need it.

[The Annual Planning Outlook, released in January 2020](#), forecasts that Ontario is in a stable supply situation. After years of investment in new generation, we now have enough existing and available resources to meet most of our needs for the next decade. This provides the IESO the opportunity to focus on increasing the cost-effectiveness of the electricity system by introducing increased competition and stimulating innovation.

Starting in 2023, new commitments for existing and available resources will be needed as generation contracts expire and nuclear refurbishments get underway. Capacity auctions will provide one platform for these resources competing to meet Ontario's electricity capacity and energy needs at the lowest cost.

To meet these needs, and provide opportunities for resources in the market, the IESO has been evolving the Demand Response Auction into a more competitive Capacity Auction. The IESO intends to accomplish this by enabling existing and available resources to participate and compete alongside demand response and off-contract generators.

This approach recognizes that developing a Capacity Auction is an evolutionary process – and that experiences in other jurisdictions and lessons learned over time which are critical to achieving an increased robust, competitive and enduring mechanism to meet Ontario's system needs.

This document describes the design elements for the Capacity Auction, scheduled to be held in March 2021, and reflects the changes required to facilitate the evolution from the Capacity Auction planned for June 2020.

How the Capacity Auction will evolve?

It is anticipated that every Capacity Auction will evolve at a measured pace growing allowing the IESO to refine auctions features when appropriate – responding changes in system need and participant

requested changes. The auction results will drive participant involvement in future auctions and any design changes will be proposed to stakeholders in a transparent manner. Enhancing the approach to Capacity Auctions by opening participation to other resources is another step towards a more competitive electricity marketplace. This moves the IESO down the path of *efficiency, competition, and transparency* – the key principles of our market renewal efforts.

June 2020 Capacity Auction – Expanded on the existing Demand Response Auction by adding dispatchable generators and storage without a contract, and system-backed imports.

March 2021 Capacity Auction (originally scheduled for December 2020) – Expands on the June 2020 auction by further expanding participation to generator-backed imports and self-scheduling generators and storage without a contract. It also incorporates a market power mitigation process to remove the potential of an organization unilaterally affecting market outcomes. Finally, the IESO is shifting to a more comprehensive qualification of capacity that is offered by participants into the auction.

Related activities to evolve the IESO markets

In order to provide capacity to meet resource adequacy, the capacity resource has to be available for it to be dispatched in the energy market. The IESO recognizes the potential areas for greater efficiency in the current energy market. Through the Market Development Advisory Group, the Demand Response Working Group, the Energy Storage Advisory Committee, and other related efforts, opportunities and gaps are examined for enabling and enhancing existing, new and emerging resources' ability to deliver services to the IESO. Any enhancements could be incorporated into future auction designs and obligations for auction participants

Eligibility and participation criteria

Eligibility and Participation Criteria in the March 2021 Capacity Auction:

Resources Eligible to Participate	Resources Ineligible to Participate
<ul style="list-style-type: none"> • Demand Response Resources Demand response resources may participate as one of the following types: Dispatchable Loads; Physical Hourly Demand Response; Virtual Hourly Demand Response – Residential; or Virtual Hourly Demand Response – Commercial & Industrial. • Capacity Generation Resources Existing generation facilities or units registered in the IESO-Administered Markets prior to Capacity Qualification that are both Non-committed and either Dispatchable non-variable or Self-Scheduling resources. 	<ul style="list-style-type: none"> • Capacity from resources contracted wholly or in part for energy or capacity (this includes both the contracted capacity or the merchant component of a resource) • Resources associated with Rate Regulated Facilities • Energy efficiency resources • Resources not permitted by law in Ontario (e.g., coal-fired generation)

Resources Eligible to Participate	Resources Ineligible to Participate
<ul style="list-style-type: none"> • System-Backed Capacity Import Resources Imported capacity that is attributed to, or considered to be supplied from, the entire system of a neighbouring jurisdiction. • Capacity Storage Resources Storage facilities registered in the energy market and, are licensed with the OEB as electricity storage; and are Non-committed. • Generator-Backed Capacity Import Resources Imported capacity that is attributed to, or considered to be supplied from, a specific generator of a type allowed to participate within Ontario, in a neighbouring jurisdiction that is not under any contract for any portion of their capacity. 	<ul style="list-style-type: none"> • Hybrid Injections and Withdrawals (e.g. combined solar plus storage projects) • Generation Resources not registered in the IESO-Administered Market (IAM) at the time of Capacity Qualification (excluding Generator-Backed Imports) Generators that have not completed registration at the time of capacity qualification in the IESO-Administered Markets are not considered 'existing' and are not eligible in the March 2021 Capacity Auction. • Variable Generation Resources • New Resources and Upgrades (Except DR)

Key Auction Periods



Pre-auction period

Approximately four months before the auction, the IESO will publish a report stating how much capacity will be targeted through the auction, along with key milestones, auction parameters and zonal constraints. The IESO will set the target capacity to ensure reliability needs are met at the lowest cost over the longer term. This means the target capacity will be set to reflect the immediate capacity needs, but also set to incent participation from a wider-range of providers to encourage competition. Chapter 7 provides more details of the pre-auction period.

Auction period

The auction period is the length of time beginning when the IESO begins accepting auction offers to the time when the IESO posts auction results. Chapter 8 details how the auction is cleared using auction offers.

Forward period

The forward period is the time between an auction and the first day participants are obligated to deliver on their capacity obligation – which will be approximately 14 months for the summer obligation period and 20 months for the winter obligation period. Chapter 9 provides details of what participants are may do during the forward period.

Obligation period

Participants that clear the auction will receive payments during the applicable obligation period(s) based on their total cleared capacity and the applicable auction clearing price. The amount of capacity that clears in the auction becomes the participant's capacity obligation; participants must satisfy an obligation to make its capacity available by participating in the day-ahead commitment process and through to real-time in the energy market, as described in Chapter 10. The Capacity Auction will continue to use two seasonal obligation periods in each auction year:

- Summer – May 1, 2022 to October 31, 2022
- Winter – November 1, 2022 to April 30, 2023

Conclusion

The continued evolution of the Capacity Auction is a phased approach to a growing competitive marketplace. Taking a phased approach that minimizes disruption to the existing market and allows for all parties to learn from these incremental changes. This will simultaneously enable greater participation with better cost effectiveness; ensuring that reliability needs over the long term are met with a focus of enabling competition to maintain a downward pressure on costs.

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1. Introduction

The Independent Electricity System Operator (IESO) is responsible for reliable operation of the Ontario power system. Therefore, it continually assesses and plans for future needs of Ontario's electricity system. In the course of these assessments, the IESO identified emerging capacity needs in the early 2020s. To address these needs, in 2019 the IESO began to evolve its Demand Response Auction into a broader Capacity Auction. This document describes the design elements for the Capacity Auction, scheduled to be held in March 2021. It reflects the IESO's current expectation of modifications required to facilitate the continuing evolution from the June 2020 Capacity Auction.

This document assumes that the reader is familiar with the terminology and design of the June 2020 Capacity Auction, the rules and mechanisms of which will be used as a foundation for the subsequent Capacity Auction scheduled for March 2021. For more information, please refer to the [June 2020 Capacity Auction Design Document](#), [Market Manual 12.0](#) and the [Market Rules for the Ontario Electricity Market](#).

1.1 Design Principles

The design of the Capacity Auction was developed with reference to the following principles:

Certainty: Wherever reasonable, maintain consistency with the June 2020 Capacity Auction in order to minimize the administrative challenges and disruption to existing businesses.

Competition: Provide open, fair, non-discriminatory competitive opportunities for participants to help meet evolving system needs by enhancing the June 2020 Capacity Auction to allow participation from additional resources.

Transparency: Ensure that accurate, timely and relevant information is available and accessible to market participants to enable their effective participation.

Implementability: Develop design decisions by working together with stakeholders to evolve the June 2020 Capacity Auction in a feasible and practical manner.

Efficiency: Develop a market mechanism that aims to reduce out-of-market payments and deliver efficient outcomes.

1.2 Capacity Auction Objective

The objective of the Capacity Auction is to secure capacity to help meet Ontario's future resource adequacy needs. Forward markets, especially those with longer lead times like a capacity auction, aim to address reliability requirements that are inherently probabilistic in nature (i.e. they cannot be quantified with exact certainty). They must ensure acceptable level of reliability in the product being purchased by buyer, while simultaneously setting fair and transparent expectations on what participants must provide to the buyer.

In anticipation of growing resource adequacy needs, the IESO is evolving its existing Capacity Auction for March 2021. In pursuing this objective, the Capacity Auction seeks to provide assurance that capacity acquired through the auction is available to produce electricity or reduce consumption in a manner that supports real-time operations.

The IESO is introducing the following major design enhancements:

Expanding Participation to Generator-Backed Imports and Self-Scheduling Generation Facilities

The changes anticipated for March 2021 aim to increase competition by facilitating participation from Generator-Backed Capacity Imports and Self-Scheduling Generation Facilities to compete with Demand Response Resources, Capacity Generation Resources, Capacity Storage Resources and System-Backed Capacity Import Resources.

Consolidated Resources

The March 2021 Capacity Auction will allow Capacity Auction Participants (CAPs) to consolidate multiple resources within the same registered facility into a single Capacity Auction Resource (CAR). Consolidation will benefit CAPs by allowing them to spread their capacity obligations over multiple resources, and thereby giving them greater flexibility in fulfilling their capacity obligation.

Capacity Qualification

By introducing an IESO-administered Capacity Qualification process, both the IESO and participants in the auction will have the confidence that the capacity contribution from each resource is being accounted for appropriately using fair and transparent methodologies.

Market Power Mitigation

The Market Power Mitigation framework being introduced will help ensure that Capacity Auction outcomes are competitive by removing potential opportunities for organizations that have market power to unilaterally affect market outcomes.

Greater Auction Offer Flexibility and Enhanced Auction Mechanics

The IESO will introduce multiple methods for participants to reflect their operating characteristics into their auction offer submission, which creates greater efficiency in the Capacity Auction.

Enhanced Performance Assessment

Updates to the performance assessment will better align payments and charges with the capacity qualification process to help ensure that the IESO is able to get the capacity when needed.

1.3 Design Document Purpose

This design document provides stakeholders and the IESO with a common understanding of the design features that will be introduced with the March 2021 Capacity Auction. It describes the key design decisions (i.e., “what” is the design) and the rationale (i.e. “why” the design is evolving). The information contained in this design document is intended to inform stakeholders and to elicit feedback on the proposed design of March 2021 Capacity Auction. The IESO will put this design document into action by completing a number of activities, such as creating or modifying documents (e.g., *Market Rules for the Ontario Electricity Market*¹, Market Manuals² and training documents), and designing and implementing required tools and participant training. Design elements identified in this document may evolve through the implementation phase, or otherwise change in response to implementation challenges, and the IESO will continue to engage with stakeholders regarding any such changes. The final design that will be implemented will be incorporated into the appropriate market rule, manual or process document.

Input and Review

This document is intended to work alongside the stakeholder engagement framework to ensure that stakeholders have:

- Appropriate opportunities for input into Capacity Auction design,
- Visibility into key IESO processes and decision-making, and
- Adequate opportunity to seek a review or consultation concerning certain IESO decisions.

1 The Market Rules for the Ontario Electricity Market describes the rules governing the IESO-controlled grid (ICG) and establishing and governing the IESO-administered markets (IAM), together with all Market Manuals, policies, and guidelines issued by the IESO, all as amended or replaced from time to time.

2 Market Manuals provide detailed descriptions of the requirements and steps for completing various activities specified in the Market Rules for the IESO and participants. The documents include the forms and agreements required by market participants. Both Market Rules and Market Manuals can be found on the IESO website.

1.4 Design Document Structure

This design document is divided into chapters that group activities as follows:

Introduction to this design document, and the Capacity Auction:

[Chapter 1: Introduction](#)

[Chapter 2: Auction Overview and Timelines](#)

March 2021 Capacity Auction design elements that will either undergo significant changes from the June 2020 Capacity Auction, or are new design elements being introduced

[Chapter 3: Expanding Participation in the Capacity Auction –Generator-Backed Capacity Import Resources, Capacity Self Scheduling Resources](#)

[Chapter 4: Consolidation of Resources](#)

[Chapter 5: Capacity Qualification Process](#)

[Chapter 6: Market Power Mitigation Process](#)

March 2021 Capacity Auction periods and descriptions of changes from the June 2020 Capacity Auction:

[Chapter 7: Pre-Auction Period](#)

[Chapter 8: Auction Period](#)

[Chapter 9: Forward Period](#)

[Chapter 10: Commitment Period](#)

The four major auction periods and associated timelines described in this document are illustrated in Figure 1.



Figure 1 | Capacity Auction Periods

Decisions relating to each Capacity Auction design feature are presented as follows:

Approach in the June 2020 Capacity Auction: This section describes how a given design feature is implemented in the June 2020 Capacity Auction.

Approach in the March 2021 Capacity Auction: This section describes how a given design feature will evolve, change or remain the same in the Capacity Auction scheduled for March 2021. A “Decision” text box summarizes the decision(s) relating to the design feature.

- Where a design feature will undergo material changes from the June 2020 Capacity Auction, the associated rationale for the respective decision is provided.
- If a feature is fundamentally the same as the June 2020 Capacity Auction, then no additional rationale is provided.

At the end of each chapter that describes how Capacity Auction activities will undergo material changes from the June 2020 Capacity, there is an additional section called **Anticipated Document and Tool Impacts** that is divided as follows:

- **Impacted Market Rules:** This section describes impacts to the Market Rules.
- **Impacted Market Manuals:** This section describes impacts to IESO Market Manuals.
- **Other Impacts:** This section describes impacts to IT Tools, Reporting, etc.

Although most terminology used in this document is consistent with the June 2020 Capacity Auction design laid out in *Market Manual 12.0* and defined in the *Market Rules for the Ontario Electricity Market*, “Chapter 11: Definitions,” some terms may differ. Defined terms specific to this document, or that differ from those provided in Market Rules or Market Manuals, are described in the [Glossary](#) located at the end of this document. These terms may not reflect the final terms proposed in the updated Market Rules and Market Manuals.

1.5 Eligible Organizations in the Capacity Auction

In order to participate in a Capacity Auction, organizations are required to register with the IESO. Once registered, they may seek to authorize as a CAP. This authorization enables participation in future Capacity Auctions. If the organization secures a position in a Capacity Auction (i.e. ‘clears the auction’ or receives a Capacity Obligation), then they must be authorized as a Capacity Market Participant (CMP) to receive Availability Payments and to fulfill their Capacity Obligations during the Obligation Period.

CAPs with resources that are eligible to participate in a Capacity Auction will initiate the process with the IESO through the capacity qualification process. During the capacity qualification process, the CAP will identify specific energy resources or placeholders (if resources may not yet be registered with the IESO)

will be identified as a potential CAR. Should the CAP receive a Capacity Obligation for the resource, it will then be deemed a CAR.

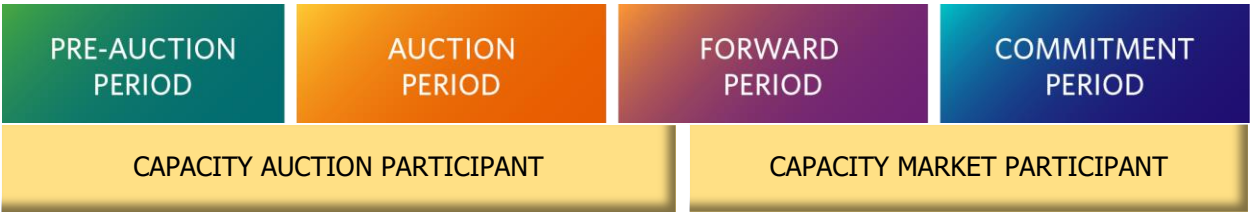


Figure 2 | Capacity Auction Authorization Types

1.6 Eligible Resource Types in the Capacity Auction

The table below describes the resources that will be eligible to participate in the March 2021 Capacity Auction. Resources associated with facilities that are Rate-Regulated, subject of a capacity type contract with the IESO or the Ontario Electricity Financial Corporation (OEFC) for any portion of an Obligation Period will be ineligible to participate for that period. System backed capacity will only be accepted if such capacity, or equivalent capacity, is in excess of current contracted obligations to the IESO. Eligibility from a specific resource within Ontario in the Capacity Auction requires that the resource be able to participate in the real-time energy market because resources ultimately need to be able to use their capacity to deliver energy or reduce consumption in the energy market. Consistent with the *Market Rules Chapter 7, Section 2.2*, the minimum capacity of any individual physical resource within a CAR is 1 MW. Hourly Demand Response (HDR) resources may consolidate through the contributor management process described in *Market Manual 12.0 Capacity Auctions*, Section 6.2.1 Contributor Management to meet this requirement.

Resources Eligible to Participate	Resources Ineligible to Participate
<ul style="list-style-type: none"> Demand Response Resources Demand response resources may participate as one of the following types: Dispatchable Loads; Physical Hourly Demand Response; Virtual Hourly Demand Response – Residential; or Virtual Hourly Demand Response – Commercial & Industrial. Capacity Generation Resources Existing generation facilities or units registered in the IESO-Administered Markets prior to Capacity Qualification that are both Non-committed and either Dispatchable non-variable or Self-Scheduling resources. System-Backed Capacity Import Resources Imported capacity that is attributed to, or considered to be supplied from, the entire system of a neighbouring jurisdiction. Capacity Storage Resources Storage facilities registered in the energy market and, are licensed with the OEB as electricity storage; and are Non-committed. Generator-Backed Capacity Import Resources Imported capacity that is attributed to, or considered to be supplied from, a specific generator of a type allowed to participate within Ontario, in a neighbouring jurisdiction that is not under any contract for any portion of their capacity. 	<ul style="list-style-type: none"> Capacity from resources contracted wholly or in part for energy or capacity (this includes both the contracted capacity or the merchant component of a resource) Resources associated with Rate Regulated Facilities Energy efficiency resources Resources not permitted by law in Ontario (e.g., coal-fired generation) Hybrid Injections and Withdrawals (e.g. combined solar plus storage projects) Generation Resources not registered in the IESO-Administered Market (IAM) at the time of Capacity Qualification (excluding Generator-Backed Imports) Generators that have not completed registration at the time of capacity qualification in the IESO-Administered Markets are not considered 'existing' and are not eligible in the March 2021 Capacity Auction. Variable Generation Resources New Resources and Uprates (Except DR)

Resource Eligibility in the March 2021 Capacity Auction

2. Auction Overview and Timelines

This chapter provides an overview of the auction periods and associated timelines for the Capacity Auction. The Capacity Auction has four major periods – pre-auction, auction, forward and commitment – each of which involves different IESO and participant activities (refer to Figure 3).

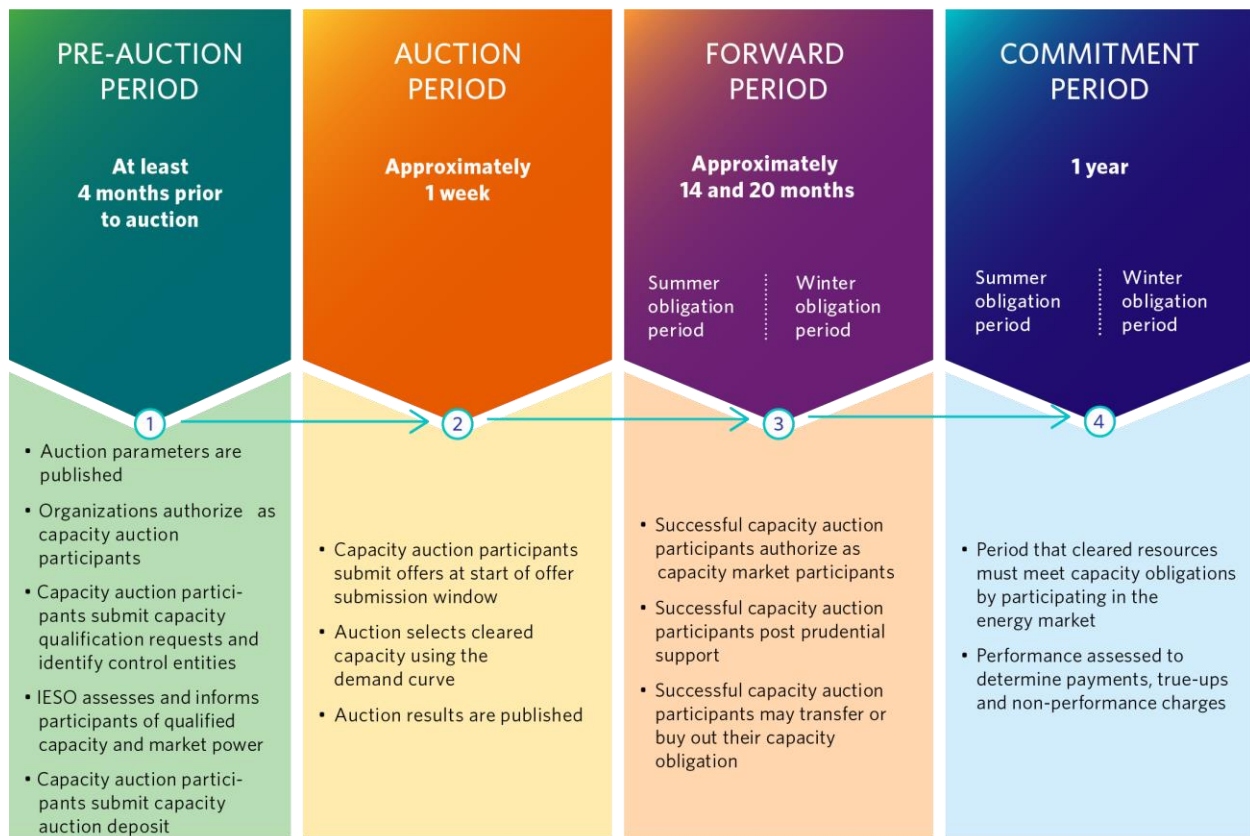


Figure 3 | Overview of Activities by Capacity Auction Period

2.1 Pre-Auction Period

The Pre-Auction Period is the first period in an auction cycle during which prospective auction participants and the IESO perform various tasks to ensure that the necessary inputs are prepared to conduct the auction. The pre-auction period begins when the IESO publishes the pre-auction report.

Approach in the June 2020 Capacity Auction

At least two months before the auction, the IESO publishes a pre-auction report stating the quantity of capacity the auction will seek to secure (Target Capacity), along with key milestones, demand curve parameters, zonal constraints and import constraints for the purposes of acquiring capacity through the auction.

Participants may complete authorization as a Capacity Auction Participant (CAP) in advance of or during the Pre-Auction Period. During the Pre-Auction Period, participants are required to indicate their interest to participate in a given Capacity Auction by submitting to the IESO the amount of auction capacity they could offer into the upcoming Capacity Auction.

Approach in the March 2021 Capacity Auction

Decision 1

The pre-auction report will continue to have all the information that was presented in the June 2020 Capacity Auction but will now additionally include Capacity Qualification criteria and Market Power Mitigation process related information.

Decision 2

The duration of the pre-auction period will be lengthened to approximately four months. The longer pre-auction period will allow participants to know the target capacity for a capacity auction and prepare accordingly. Additionally, the longer pre-auction period is required for the IESO to complete the market power mitigation and capacity qualification processes. These timelines will be published in the pre-auction report.

The Pre-Auction report will also now include the following Capacity Qualification information, explained further in [Chapter 5](#):

- Qualification criteria, which includes the qualification window defined in terms of days per season and hours per day, along with duration. The qualification criteria are used for qualifying hydroelectric resources and self-scheduling resources.

- Default forced outage rates to be applied to resources with less than five years of production history.
- Temperatures to be used for assessing qualified capacity of thermal resources by electrical zone or neighbouring control area and obligation period.

The Pre-Auction report will now include the following Market Power Mitigation information, explain further in [Chapter 6](#):

- Small Fish Threshold, MW of Installed Capacity (ICAP)
- Default Offer Cap, \$/MW-day

2.2 Auction Period

The Auction Period is the length of time commencing with the opening of the window during which the CAP can submit Capacity Auction Offers, and finishing at the time at which the IESO publishes auction results.

Approach in the June 2020 Capacity Auction

The June 2020 Capacity Auction is scheduled for the fourth Wednesday in June 2020 (June 24, 2020). The offer submission window opens for two business days. The auction clearing process starts after the offer submission window closes and the results are then published in a post-auction report four business days following the closure of the auction offer window.

Approach in the March 2021 Capacity Auction

Decision

The IESO is targeting March 2021 for the start of the Auction Period. The length of time of the auction period will remain unchanged, including the length of time for the offer submission window and the subsequent publication of the post-auction report.

2.3 Forward Period

The Forward Period is the period of time immediately following the release of the post-auction reports to the commencement of an Obligation Period.

Approach in the June 2020 Capacity Auction

The length of the Forward Period is approximately 11 months for the summer Obligation Period and 17 months for the winter Obligation Period. During this time, CAPs will be required to authorize as Capacity Market Participants (CMP) (if not previously authorized), register demand response resources into the IESO's energy market (if these demand response resources were not registered prior to the auction period), and if required complete capacity obligation transfers or buy-out of their capacity obligations.

Approach in the March 2021 Capacity Auction

Decision

The Forward Period for the Capacity Auction will change to approximately 14 months for the summer Obligation Period, and 20 months for the winter Obligation Period (an increase of approximately 3 months for each Obligation Period).

The length of the Forward Period is being extended to increase certainty, for both the IESO and participants, of future Capacity Obligations as we prepare for greater capacity needs in 2023 and beyond. The longer Forward Period allows the IESO to assess whether the Capacity Auction was successful in acquiring the required capacity to maintain the reliability of Ontario's system, and potentially take corrective actions if required.

2.4 Commitment and Obligation Periods

The Obligation Period is the period of time for which a CMP is required to fulfill its capacity obligation through the day-ahead commitment process and through to real-time energy market. The Commitment Period is the period of time for each Capacity Auction over which it can secure capacity obligations. It consists of two six months seasonal Obligation Periods.

Approach in the June 2020 Capacity Auction

The Commitment Period for the June 2020 Auction is May 1, 2021 to April 30, 2022. The two Obligation Periods are:

Summer – May 1, 2021 to October 31, 2021

Winter – November 1, 2021 to April 30, 2022

Each Obligation Period is associated with its own Availability Window. This availability window is the range of business days and hours during an Obligation Period that any CAR is expected to be ready to supply energy if economic or for system need. The summer availability window is business days from

12:00 to 21:00 EST (hour ending 13 to hour ending 21) and the winter availability window is business days from 16:00 to 21:00 EST (hour ending 17 to hour ending 21).

Approach in the March 2021 Capacity Auction

Decision

There is no change to the Commitment Periods and Obligation Periods. The March 2021 Capacity Auction will have a one-year overall Commitment Period that consists of two six-month Obligation Periods.

The Commitment Period for the March 2021 Auction will be May 1, 2022 to April 30, 2023. The Obligation Periods will be:

- Summer: May 1, 2022 – October 31, 2022
- Winter: November 1, 2022 – April 30, 2023

2.5 Anticipated Document and Tool Impacts

Impacted Market Rules

Market Rules	Description of Change
No changes anticipated	No changes anticipated

Impacted Market Manuals

Market Manuals	Description of Change
Market Manual 12	<ul style="list-style-type: none">• Revise timelines to include capacity qualification and market power mitigation processes• Deadline to submit capacity qualification information will be prior to the start of market power mitigation processes• Stipulate additional information that will be published in the pre-auction report

Other Impacts

Other Impact (IT Tool, Reporting, etc.)	Description of Change
Pre-Auction Report	Add new tables for Market Power Mitigation information: Small Fish Threshold, Default Offer Cap, Residual Supply Index (RSI) Threshold Add additional milestones relating to capacity qualification and market power mitigation processes.

3. Expanding Participation in the Capacity Auction – Generator-Backed Capacity Import Resources, Capacity Self Scheduling Resources

As part of the IESO's objective to increase competition in the Capacity Auction, while respecting the principles of certainty and implementability, the March 2021 Capacity Auction will allow two new resource types to become eligible for participation. This chapter provides details regarding the participation of Generator-Backed Capacity Import Resources and Capacity Self-Scheduling Resources in the Capacity Auction.

Approach in the June 2020 Capacity Auction

The June 2020 Capacity Auction allows participation from the following types of Capacity Auction Resources (CARs):

- Demand Response Resources, including Hourly Demand Response Resources and Capacity Dispatchable Load Resources
- Capacity Generation Resources, which must be dispatchable in the energy market
- System-Backed Capacity Resources
- Capacity Storage Resources (participating with their registered generation resource)

Approach in the March 2021 Capacity Auction

Decision

The Capacity Auction scheduled for March 2021 will evolve the June 2020 Capacity Auction as a mechanism for acquiring capacity by further allowing Generator-Backed Capacity Import Resources and Capacity Self-Scheduling Resources to participate.

Allowing participation of additional resources in the March 2021 Capacity Auction will broaden participation in the IESO's Capacity Auction from resources that are already operational in either the IESO's energy market or a neighbouring energy market. In addition, enabling participation from both

Generator-Backed Capacity Import Resources and Capacity Self-Scheduling Resources, can make use of design elements from the June 2020 Capacity Auction, making them highly implementable.

3.1 Generator-Backed Capacity Import Resources

As part of the Capacity Auction's objective to increase competition, the IESO will enable participation of Generator -Backed Capacity Resources starting with the March 2021 Capacity Auction.

3.1.1 Pre-Auction Authorization

Organizations wishing to offer Generator-Backed Capacity Import Resources located within a neighbouring trading jurisdiction, like all other organizations participating in the Capacity Auction, will be required to authorize as a Capacity Auction Participant (CAP) in order to qualify resources in a Capacity Auction. The organization must also authorize as an Energy Trader - Importer in the IESO-Administered Market prior to authorization as a CAP.

3.1.2 Capacity Qualification and Eligibility

During capacity qualification as described in [Chapter 5](#), generator owners in a neighbouring trading jurisdiction that wish to participate will qualify using the resource type of "Generator-Backed Capacity Import".

Resources that are eligible to participate in the Capacity Auction must meet the following requirements:

Generator-Backed Capacity Imports must:

- Come from an existing in-service and commissioned generation facility located in a neighbouring jurisdiction whose Balancing Area is willing to facilitate generator-backed exports out of their jurisdiction area into Ontario and with both Balancing Authorities³ having appropriate documentation in place,
- Be able to transmit energy from the generation facility to the Ontario border,
- Be a resource type that is currently permitted to participate in the IESO's capacity auction,
- Not have any portion of its capacity already contracted for the Obligation Period to any other jurisdiction, at the time of the auction. Furthermore, the capacity sold to Ontario from the external generator shall not be used to satisfy resource adequacy of the jurisdiction in which external generator resides (neighboring source jurisdiction),

³ A balancing authority is defined by NERC as "the responsible entity that integrates resource plans ahead of time, maintains Demand and resource balance within a Balancing Authority Area, and supports Interconnection frequency in real time."

- Have a written approval from the sourcing jurisdiction where the backing generator for the Generator-Backed Capacity Import is located to specify:
 - the capacity resource(s) approved,
 - the commitment period for which the approval applies, including start and end dates,
 - the maximum MW quantities approved, and
 - any other information or limitations on the approval that may be required by the IESO.

During capacity qualification, CAPs must indicate the resource type backing the Generator-Backed Capacity Import as well as generation fuel type to ensure a proper capacity qualification is done by the IESO as described in [Chapter 5](#). Only generation types eligible to participate in Ontario's Capacity Auction will be allowed to provide a Generator-Backed Capacity Import (as per requirements in in Section 1.6). The total amount of auction capacity accepted will be limited by the IESO by the Capacity Auction import constraints. All resources identified as Generator-Backed Capacity Imports will be categorized as a physical resource for optimization purposes in the Capacity Auction tool and for Capacity Obligation transfers.

3.1.3. Auction Deposit

CAPs that offer Generator-Backed Capacity Import Resources, like all other organizations participating in the Capacity Auction, are required to submit a Capacity Auction deposit. Further information is available in [Section 7.5](#).

3.1.4 Offer Submission and Auction Clearing

CAPs that offer Generator-Backed Capacity Import Resources will offer into the Capacity Auction in the same manner as other resources qualified as potential CARs. Generator-Backed Capacity Import Resources will be grouped with resources with physical type obligations and will be subject to the zonal auction constraints, a global import limit as well as the interface⁴ limit for which the Generator-Backed Capacity Import Resource is being offered on. CAPs that offer Generator-Backed Capacity Import Resources will submit their offers into the Capacity Auction in the same manner as all other resources. The interfaces eligible for use in a given Capacity Auction will be listed in the Pre-Auction Report.

⁴ The term interface, in this document, refers the groups of transmission circuits which connect between the IESO-Controlled Grid and neighbouring systems (or external control areas). These are sometimes referred to as interties or interconnections in other IESO documents.

3.1.5 Forward Period Obligations

CAPs who receive a Capacity Obligation for a Generator-Backed Capacity Import Resource will be subject to the same forward period obligations as a physical resource that is already registered in the IESO-Administered Market. Should a participant choose to transfer their Capacity Obligation, they will be allowed to transfer to resources with physical Capacity Obligations, subject to the criteria for a Capacity Obligation transfer described in [Section 9.4](#).

3.1.6 Energy Market Participation

CAPs who receive a Capacity Obligation for a Generator-Backed Capacity Import Resource are expected to meet their Capacity Obligations by participating in the energy market. Participation activities include:

- Dispatch Data Submission
- Resource Dispatch
- Test Activations

The following sections provide detailed descriptions of these activities.

Dispatch Data Submission

All Capacity Market Participants with a Capacity Obligation for a Generator-Backed Capacity Import Resource are eligible for an Availability Payment associated with their capacity. The Generator-Backed Capacity Import is required to have an hourly import energy offer into the IESO-administered market, in each hour of the availability window, for which it has secured a capacity import obligation. The Capacity Obligation will include an availability performance assessment which will assess whether the Capacity Market Participant submitted and maintained import offers day-ahead and pre-dispatch (PD) for the hours during the availability window, in a manner similar to other dispatchable resources. Depending on the generator type, the IESO will complete an hourly assessment of availability, and consider the minimum offer into the energy market in day-ahead through to pre-dispatch, stopping at either one-hour ahead pre-dispatch (for quick start generators) or x hours ahead pre-dispatch where x is the generator's start up time. The assessment will be the same as a generator located internally within Ontario.

Capacity Market Participants that do not comply with this requirement may be subject to the non-performance charges described in [Section 10.3](#).

Resource Dispatch

The Generator-Backed Capacity Import will be scheduled as consistent with all other import transactions as per IESO's *Market Manual 4.2 Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets* and *Market Manual 4.3 Real Time Scheduling of the Physical Market*. In the event the

import is scheduled in Ontario's market, it will be expected to be successfully delivered in real time. The tagging of the Generator-Backed Capacity Import Resource must include the letters "GCAP" in between the Balancing Authority identification (e.g., SOURCINGBA_***GCAP***_ONT).

Under normal system conditions, the backing generator is not required to be online and injecting. A call of a Generator-Backed Capacity import can be made starting in the day-ahead and up to a resource specific number of hours prior to the beginning of the dispatch hour. The resource specific number of hours will be based on the backing generators start up time. During the call, the IESO will indicate which hour(s) the import is required, and the MW amount that is being called upon. This MW amount will not exceed the capacity obligation. When a capacity call is made, the Generator-Backed Capacity Import Resource participant must ensure the generator backed import is scheduled and the backing generator is injecting an amount equal to or greater than the called capacity. The called capacity will be equal or less than their capacity obligation.

When the Generator-Backed Capacity Import is scheduled, the neighboring source jurisdiction can only curtail this transaction under following conditions:

- To correct or prevent an exceedance or a violation of voltage, stability, or thermal transmission limits/criteria;
- To prevent the threat to the safety of any person, damage to equipment, the environment or the violation of any applicable law and;
- To correct an adequacy issue and the backing generator is not online and generating to at least the import schedule amount

Test Activations

The IESO may schedule test activations for Capacity Market Participants to verify that the resource is able to satisfy its Capacity Obligation. Up to two tests may be scheduled during each Obligation Period, and tests are scheduled to occur during the availability window of a dispatch day. A second test is only scheduled if the first test was not deemed a pass. The objective of the test is to ensure that Generator-Backed Capacity Import can navigate both markets (the IESO and neighboring source jurisdiction) during a capacity call, and backing generator can support that capacity call.

The tests are conducted as follows:

- Up to a resource specific number of hours in advance of any test, a Generator-Backed Capacity Import Resource participant will receive a test notification, and required to take following actions:
 - the Generator-Backed Capacity Import is required to have an import scheduled and should appear in the last run of pre-dispatch (PD-1);
 - the backing generator should be online for the duration of the test hours;
 - tests may be scheduled for a duration of up to 4 hours.
- If a Generator-Backed Capacity Import Resource being tested is successfully scheduled in pre-dispatch and not curtailed by reasons within its control, and if the output of the backing generator is equal to or greater than its capacity obligation, the test will be deemed a pass.
- If a Generator-Backed Capacity Import Resource is unable to comply with the test activation, 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*. The IESO will consider this information when scheduling a subsequent test activation.

Failure of a Generator-Backed Capacity Import Resource to perform successful test activation may result in one or more of the following:

- Non-performance charges, as specified in [Section 10.3](#)
- A subsequent test activation; and/or
- A compliance investigation to be performed by the Markets Assessment and Compliance Division.

At the IESO's discretion, a test activation may not be required if a Capacity Market Participant can demonstrate that it has met its Capacity Obligation during the Obligation Period by generating at least the obligation amount during which time the associated import has been scheduled in real-time or during a past test activation.

3.1.7 Performance Obligation Assessment and Settlements

Capacity Market Participants with Generator-Backed Capacity Import Resource Capacity Obligations are settled using the physical markets settlement process for both availability payments and non-performance charges. Non-performance charges are measured using the submitted offers and the schedule for the interface and result from a failure to satisfy Capacity Obligations. These charges are intended to incent compliance, ensure integrity of the electricity market, and to avoid the IESO paying for Capacity

Obligations that have not been satisfied. Payment and charges described in this section are assessed and calculated for each CAR.

Availability Payment

The participant is paid an Availability Payment on a monthly basis for each capacity obligation it secures in the capacity auction. For all resource types, each payment is paid based on the Capacity Obligation, the Capacity Auction Clearing Price associated with the Capacity Obligation, the number of hours of availability and number of business days within a month. The payment for the month will be calculated as:

$$Availability\ Payment = \sum_{h=1}^n CCO_k \times CACP_h$$

Where:

“h” represents an hour within the Hours of Availability for the month,

“n” is equal to the number of Hours of Availability for the month,

“CCO_k” is the Capacity Obligation amount associated with CAR for the Obligation Period for Capacity Market Participant ‘k’. The initial Capacity Obligation is acquired through a Capacity Auction and subject to being reduced via the buy-out process (MW), and

“CACP_h” is the hourly equivalent Capacity Auction Clearing Price associated with a Capacity Obligation for the Obligation Period (\$/MW-hour).

Non-Performance Charges

Availability Charge

The Availability Charge applies to each CAR in any hour within the availability window where the Capacity Market Participant did not submit and maintain offers at quantities at or above their Capacity Obligation from day-ahead through to one hour ahead pre-dispatch. The Availability Charge is designed to incent compliance to meeting Capacity Obligations through the submission of offers for every hour of the availability window.

The daily Availability Charge will be:

$$Availability\ Charge = \sum_{h=1}^n -1 \times Max(0, CCO_k - CAEO_h) \times CACP_h \times CNPF$$

Where:

“h” represents an hour within the Hours of Availability for the business day,

"n" is equal to the number of Hours of Availability for the business day,

"CCO_k" is the Capacity Obligation associated with a CAR secured through a Capacity Auction by Capacity Market Participant 'k',

"CAEO_h" is the offered quantity for hour 'h' and is derived from the price-quantity pairs of the energy offers of each resource associated with a Generator-Backed Capacity Import Resource,

"CACP_h" is the Hourly Equivalent Auction Clearing Price (\$/MW-hour), and

"CNPF" is the Capacity Non-Performance Factor for the month.

Capacity Charge

Capacity Market Participants with a Generator-Backed Capacity Import Resource associated with its Capacity Obligation are subject to a capacity charge when the import is curtailed at check out for reasons within the Capacity Market Participant's control (as specified in *Market Manual 4.3: Real-Time Scheduling of the Physical Markets*)⁵ and/or if the backing generator is not generating to at least the obligation amount during a test activation.

The capacity charge will equal the availability payment for the entirety of the month in which the test occurred, multiplied by that month's Capacity Non-Performance Factor.

3.2 Capacity Self-Scheduling Resources

As part of the Capacity Auction's objective to increase competition, the IESO will enable participation of Capacity Self-Scheduling Resources in the March 2021 Capacity Auction. A Capacity Self-Scheduling Resource is any Non-Committed energy resource participating in the IESO energy market with a bid type of self-scheduling⁶.

3.2.1 Authorization

Organizations that own self-scheduling resources, like all other organizations participating in the Capacity Auction are required to authorize as a CAP in order to qualify CARs in a Capacity Auction.

⁵ These reasons include OTH and MrNH

⁶ In general, self-scheduling resources consist of generation or storage facilities less than 10 MW in size.

3.2.2 Capacity Qualification and Eligibility

During capacity qualification as described in [Chapter 5](#) organizations that wish to participate using a self-scheduling resource will submit a capacity qualification request for this resource, and identify it as a “Capacity Self-Scheduling Resource.” A Capacity Self-Scheduling Resource will have to meet the following criteria to be eligible to participate in the Capacity Auction:

- The resource must be registered in the IESO-Administered Market with a bid type of self-scheduling.
- The resource must be non-committed. Resources that are rate-regulated or contracted by the IESO for capacity or energy are not eligible.

3.2.3 Auction Deposit

CAPs that offer Capacity Self-Scheduling Resources, like all other organizations participating in the Capacity Auction, are required to submit a Capacity Auction deposit. Further information is available in [Section 7.5](#).

3.2.4 Offer Submission and Auction Clearing

CAPs will submit offers on each potential CAR (with the type Capacity Self-Scheduling Resource) in the same manner as any other type of capacity resource. Capacity Self-Scheduling Resources will receive physical obligations and will be subject to the zonal auction constraints like other physical resources.

3.2.5 Forward Period Obligations

Organizations with Capacity Self-Scheduling Resources will be subject to the same Forward Period obligations as any other physical resource that is already registered in the IESO-Administered Market. Should a participant choose to transfer their Capacity Obligation to another physical Capacity Obligation, they will be subject to the criteria for a Capacity Obligation transfer described in [Section 9.4](#).

3.2.6 Energy Market Participation

Capacity Self-Scheduling Resources are expected to meet their Capacity Obligations by participating in the energy market. Participation activities include:

- Dispatch Data Submission
- Resource Dispatch via their pre-dispatch schedules
- Test Activations

The following sections provide detailed descriptions of these activities.

Dispatch Data Submission

All Capacity Market Participants with a Capacity Self-Scheduling Resource Capacity Obligation are eligible for an Availability Payment associated with their capacity. The Capacity Obligation will include an availability performance assessment which will assess whether the Capacity Market Participant submitted and maintained schedules day-ahead and pre-dispatch for at least their Capacity Obligation amount for all the hours in the availability window. A seasonal true-up mechanism (described in [Section 10.2.2](#)) will be applied to self-scheduling resources.

Capacity Market Participants that do not comply with this requirement may be subject to the non-performance charges described in [Section 10.3](#).

Resource Dispatch

Self-Scheduling Generation Facilities are required to submit dispatch data in accordance with *Market Manual 4.2- Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets*, and are scheduled in accordance with the procedures outlined in *Market Manual 4.3 - Real Time Scheduling of the Physical Markets*.

Testing

The IESO may schedule tests for Self-Scheduling Generation Facilities to verify that the resource can satisfy its Capacity Obligation. Up to two tests may be scheduled during each Obligation Period, and tests are scheduled to occur during the availability window of the dispatch day. Self-Scheduling Generation Facilities may be tested for up to 4 hours and will be expected to submit schedules up to the required test level and operate to those schedules for the entire duration of the test.

Tests are scheduled by the IESO up to one hour ahead of the dispatch hour by requesting the Self-Scheduling Generation Facility to operate up to their Capacity Obligation for the duration of the test period. A test will be deemed a success when the quantity of energy injected in each interval is equal to or greater than their Capacity Obligation.

Failure of a Self-Scheduled Capacity Resource to perform a successful test may result in one or more of the following:

- Non-performance charges, as specified in [Section 10.3](#);
- A subsequent test; and/or
- A compliance investigation to be performed by the Markets Assessment and Compliance Division.

At the IESO's discretion, a Self-Scheduling Generation Facility may not be tested if it has, during the relevant Obligation Period, injected into the grid the full amount of its Capacity Obligation for up to 4 hours in accordance with its submitted schedules in a manner consistent with the requirements of testing, or has demonstrated its capability via acceptable past tests.

3.2.7 Performance Obligation Assessment and Settlements

Capacity Market Participants are settled using the physical markets settlement process, for both payments and non-performance charges. Non-performance charges result from a failure to satisfy Capacity Obligations and are intended to incent compliance, ensure integrity of the electricity market and prevent the IESO paying for capacity that has not been fulfilled. Payment and charges described in this section are assessed and calculated for each CAR.

Availability Payment

The Capacity Market Participant (CMP) is paid an Availability Payment on a monthly basis for each capacity obligation it secures in the capacity auction. For all resource types, each payment is based on the Capacity Obligation, the Capacity Auction Clearing Price associated with the Capacity Obligation, the number of hours of availability and number of business days within a month. The payment for the month will be calculated as:

$$Availability\ Payment = \sum_{h=1}^n CCO_k \times CACP_h$$

Where:

"h" represents an hour within the Hours of Availability for the month,

"n" is equal to the number of Hours of Availability for the month,

"CCO_k" is the Capacity Obligation amount associated with a CAR for the Obligation Period for Capacity Market Participant 'k'. The initial Capacity Obligation is acquired through a Capacity Auction and subject to being reduced via the buy-out process (MW), and

"CACP_h" is the hourly equivalent Capacity Auction Clearing Price associated with a Capacity Obligation for the Obligation Period (\$/MW-hour).

Non-Performance Charges

Availability Charge

The Availability Charge applies to each CAR in any hour within the availability window where the participant did not submit and maintain self-schedules at quantities at or above their Capacity Obligation amount from day-ahead and pre-dispatch.

The Availability Charge will be:

$$Availability\ Charge = \sum_{h=1}^n -1 \times Max(0, CCO_k - CAS_h) \times CACP_h \times CNPF$$

Where:

"h" represents an hour within the Hours of Availability for the business day,

"n" is equal to the number of Hours of Availability for the business day,

"CCO_k" is the Capacity Obligation secured through a Capacity Auction,

"CAS_h" is the self-schedule quantity for hour 'h' derived from the self-schedules of each resource associated with a Capacity Self-Scheduling Resource,

"CACP_h" is the Hourly Equivalent Auction Clearing Price (\$/MW-hour), and

"CNPF" is the Capacity Non-Performance Factor for the month.

Capacity Charge

Self-Scheduling Capacity Resources may be subject to a capacity charge when they fail to meet the requirements of a test. The capacity charge will equal the availability payment for the entirety of the month in which the test occurred, multiplied by that month's Non-performance Factor.

3.3 Anticipated Document and Tool Impacts

Impacted Market Rules

Market Rules	Description of Change
Chapter 7, Section 19	<ul style="list-style-type: none">• Amend sections 19.6 and 19.7 to incorporate self-scheduling generation facilities under the eligibility and energy market participation requirements for capacity generation resource• Amend section 19.8 and 19.9 to incorporate generator-backed capacity imports under the eligibility and energy market participation requirements for a capacity import resource
Chapter 9, Section 4.7J	<ul style="list-style-type: none">• Amend sub-section 4.7.J.2.1A to include the submission of self-schedules for a capacity generation resource that is participating with a self-scheduling generation facility• Amend sub-section 4.7J.2.2 to remove the capacity obligation dispatch charge as it is no longer applicable to CARs• Amend sub-section 4.7J.2.3 to apply the administration charge to capacity import resources that are required to submit measurement data
Chapter 11	<ul style="list-style-type: none">• Amend the defined terms for capacity auction eligible generation resource and capacity auction eligible import resource to include provisions related to self-scheduling generation facilities and generator-backed capacity imports

Impacted Market Manuals

Market Rules	Description of Change
Market Manual 4.2 Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets	<ul style="list-style-type: none"> • Include tagging requirements for Generator Backed Imports • Include energy market participation for generator backed imports • Add new boundary entities for generator backed imports
Market Manual 12 Capacity Auctions	<ul style="list-style-type: none"> • Add participation in energy market for Generator backed imports into Section 5.2 • Include testing of generator backed imports
Market Manual 4.2 Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets	<ul style="list-style-type: none"> • Include tagging requirements for Generator Backed Imports • Include energy market participation for generator backed imports • Add new boundary entities for generator backed imports

Other Impacts

Other Impact (IT Tool, Reporting, etc.)	Description of Change
Online IESO	<ul style="list-style-type: none"> • Allow for generator backed imports to indicate the backing generator's fuel/technology type • Add new type of CAR – Generator backed import • Allow for Self Scheduler to be a type of CAR, or sub type of existing generator and storage types.
Online Models (EMI/EMS/DSO)	<ul style="list-style-type: none"> • New Resource for generator backed imports to be added into model

4. Consolidation of Resources

Approach in the June 2020 Capacity Auction

In the June 2020 Capacity Auction, Capacity Auction Participants (CAPs) complete their capacity enrolment by identifying the energy market resource(s) they intend on using to deliver a Capacity Obligation, if successful in the auction. Each individual energy market resource will be designated as a Capacity Auction Resource (CARs). Except with System-Backed Capacity Resources, a CAP must be the owner of the energy market resource to designate it as a CAR, offering it into the Capacity Auction.

Approach in the March 2021 Capacity Auction

Decision

For March 2021, CAPs will be allowed to consolidate multiple energy market resources into a single CAR. The IESO will then determine the qualified capacity for that CAR representing the maximum amount that CAR will be allowed to offer into the Capacity Auction. Further details on the Capacity Qualification Process can be found in [Chapter 5](#).

The identification of CARs during the pre-auction period will continue in the March 2021. CAPs will be allowed to consolidate multiple physical resources within a single CAR. Only resources within the same facility, as registered with the IESO, that are of the same CAR type, and registered with the IESO with the same bid/offer type, will be allowed to consolidate. CAR types eligible to consolidate are listed below:

- Capacity Dispatchable Load
- Physical Hourly Demand Response
- Capacity Generation Resource
- Capacity Storage Resource (only 'generation' resources are eligible)
- Generator-Backed Capacity Import Resource

4.1 Offer Submission and Auction Clearing

CAPs requesting to consolidate resources into a potential single CAR will submit offers for that consolidated CAR in similar manner as for their individual CARs. A consolidated CAR will be subject to the zonal auction constraints and will receive a single obligation.

4.2 Forward Period Obligations

CAPs with consolidated CARs will be subject to the same Forward Period obligations as any other CAR. This includes authorization as a Capacity Market Participant (CMP). Participants that transfer their Capacity Obligation to another physical CAR are subject to the criteria for a Capacity Obligation transfer described in [Section 9.4](#).

4.2.1 Dispatch Data Submission

All CMPs with a consolidated CAR are eligible for an Availability Payment associated with their consolidated capacity in similar manner as any other single physical resource.

The Capacity Obligation will include an availability performance assessment. This will assess whether the aggregate performance of the individual resources, mapped to the CAR, in the energy market satisfies the consolidated capacity obligation.

CMPs with a consolidated CAR that do not comply with this requirement may be subject to the non-performance charges described in [Section 10.3](#).

4.2.2 Resource Dispatch

Each individual resource that makes up a consolidated CAR is required to submit dispatch data in accordance with the *Market Manual 4.2 Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets*, and is scheduled in accordance with the procedures outlined in the *Market Manual 4.3 - Real Time Scheduling of the Physical Markets*.

4.2.3 Testing

Each individual resource that makes up a consolidated CAR will be summed to determine the CAR's performance during a test activation. A test will be deemed a success when the sum of the quantity of energy injected, or reduction of load withdrawn, satisfies the testing procedure and pass/fail criteria presented in Test Activations. Test notification timelines, is based on the CAR type.

4.3 Anticipated Document and Tool Impacts

Impacted Market Rules

Market Rules	Description of Change
No changes anticipated	No changes anticipated

Impacted Market Manuals

Market Manuals	Description of Change
Market Manual 12	Revise Section 3.2 Capacity Enrollment to describe procedural rules to permit consolidation of energy resources into a CAR Revise Section 5.2 Energy Market Participation to describe testing of consolidated resources
Market Manual 5.5	Describe application of settlement charges for consolidated resources

Other Impacts

Other Impact (IT Tool, Reporting, etc.)	Description of Change
Online IESO	Update Submit Capacity Qualification Request action to allow participants to identify multiple energy resources in a single CAR Update Records to show where a CAR is made up of multiple energy resources Update Assign Resource to Capacity Obligation action to allow multiple resources to be assigned to capacity obligation

5. Capacity Qualification Process

A key Capacity Auction concept is that each MW cleared through the auction will be expected to contribute equally towards meeting resource adequacy needs. Ensuring parity between participating resources allows the IESO to secure capacity in a transparent, open, and fair manner and, also supports obligation transfer and liquidity in the market. The capacity qualification process establishes the amount of capacity each Capacity Auction Resource (CAR) can contribute towards meeting resource adequacy needs for the relevant Obligation Period. The IESO will determine a qualified capacity value for each CAR submitted by a Capacity Auction Participant (CAP) during the pre-auction period.

There are two distinct measures of capacity used within the Capacity Auction:

- **ICAP** (installed capacity): This reflects the seasonal maximum generation/ load-reduction capability of a resource, and is determined for each Obligation Period.
- **UCAP** (Un-forced capacity): This is the ICAP value reduced by either the forced outage rates, or energy limitations, and reflects the maximum capacity that can be offered into the capacity auction.

The capacity qualification assessment is a method used by the IESO to capture the characteristics and behaviour of each CAR; where available, this process will use historic information for this assessment. For demand response and system backed imports, the submitted quantity is treated as UCAP with rationale provided in this chapter.

The capacity qualification process will yield a qualified capacity value in units of UCAP. Any resources assessed below 1 MW will not be allowed to offer into the auction. UCAP captures a resource's characteristics and behaviour over a defined period of time, including its contribution towards meeting resource adequacy needs.

The capacity qualification process for each resource type is explained in more detail in the following subsections.

Approach in the June 2020 Capacity Auction

In the June 2020 Capacity Auction, CAPs complete a capacity enrollment process by identifying the resource(s) they intend on using to deliver a Capacity Obligation and informing the IESO of the amount of capacity they intend to offer for each obligation period.

Approach in the March 2021 Capacity Auction

Decision

The IESO will replace the capacity enrollment process with capacity qualification process. It will consist of three parts: (1) the CAP will submit a capacity qualification request in Online IESO (2) the IESO will determine the qualified capacity for each CAR. The determination will take into consideration the bid/offer type of the resource(s) associated with a CAR, the technology type and the age of the resource. The IESO will privately inform the CAP of the qualified capacity of each of its CARs at least five weeks prior to the capacity auction (3) the CAP will submit a capacity auction deposit for an amount equal to or less than the qualified capacity of each CAR.

The following sections describe the capacity qualification process by CAR type and technology type, including the submission requirements for a capacity qualification request and the determination of the qualified capacity by the IESO.

5.1 Capacity Generation Resources

There are two types of Capacity Generation Resources: Dispatchable; and Self-Scheduling. Capacity Generation Resources do not include capacity storage resources that modelled in the IESO-Administered Markets as a generation facility. For capacity storage resources, please refer to Section 5.2.

5.1.1 Dispatchable Capacity Generation Resources

Thermal Resources

Decision

Dispatchable thermal resources will be qualified using the following equation:

$$UCAP \text{ (MW)} = ICAP * (1 - EFOR_d)$$

Typically, the maximum capability of thermal generating units varies with external factors such as ambient temperature and humidity. This variation in capability is reflected in their ICAP. Like all resource types, thermal generating units can have unforeseen failures resulting in partial or complete loss of service. This uncertainty in availability is reflected in how the IESO determines their Equivalent Forced Outage Rate on Demand (EFOR_d). ICAP and EFOR_d are the two main factors in determining UCAP value of thermal resources.

A thermal resource's ICAP value will be established using the existing planning process as described in the '[Resource Adequacy Methodology](#)' published in the Annual Planning Outlook. ICAP for thermal resources will be established based on the peak demand month of the season (typically July for summer and January for winter).

To support the development of a resource's ICAP, the IESO will publish the temperatures to be used to assess ICAP in the pre-auction report. The existing planning process relies on temperature derating curves submitted to the IESO annually by generators. Participants will be required to, as part of the capacity qualification request, provide consent to use the previously submitted derating curve or submit a new temperature derating curve.

EFOR_d will be an annual EFOR_d value established using the existing IESO process (5 years of historical EFOR_d data). EFOR_d will be calculated in accordance with IEEE standard 762. Resources with less than 5 years of historical EFOR_d data will be given resource fleet average EFOR_d. The IESO will publish this value in the pre-auction report.

Hydroelectric Resources

Decision

Dispatchable hydroelectric generation facilities will be qualified using the following equation:

UCAP (MW) = Average of up to 5 years of historical production selected from the hours coincident with the four consecutive hours of highest Ontario grid demand within the qualification window, from each business day, within each obligation period.

Dispatchable Hydroelectric Generation Facilities will be qualified by using up to five years of the resources' available historical production data (and adjusted for changes in the nameplate/total capacity of the facility as appropriate). It is expected that the production data of Hydroelectric Generation Facilities is an accurate reflection of their historical capability. The historical production data, gathered from the IESO's records of hourly actual quantity of energy injected to the grid, incorporates the impacts of energy limitations, forced outage rates, and weather limitations. The qualification window is described in detail in Appendix A, and the parameters will be published in the pre-auction report.

5.1.2 Self-Scheduling Capacity Generation Resources

Decision

Self-Scheduling Generation Facilities will be qualified using the following equation:

UCAP (MW) = Average of up to 5 years of historical production selected from the hours coincident with the four consecutive hours of highest Ontario grid demand within the qualification window, from each business day, within each obligation period

Self-Scheduling Generation Facilities will be qualified by using the resources' production data. Where available, 5 years of data will be used, or a period of less than 5 years when a resource has been in operation for a smaller period of time. It is expected that the production data of Self-Scheduling Generation Facilities is an accurate reflection of their historical capability. The historical production data should capture the resource's unique operational characteristics and forced outage rate. The historical production data is gathered from the IESO's records of hourly average quantity of energy injected to the grid.

The ICAP for self-scheduling generation facilities will be assumed as the maximum generator capability stored in the IESO's registration system.

The qualification window is described in detail in Appendix A, and the parameters will be published in the pre-auction report.

5.2 Capacity Storage Resources

Capacity Storage Resources may participate in the energy market as either dispatchable or self-scheduling facilities⁷.

⁷ For further information on participation in energy storage participation in energy market, please see the Energy Storage Design Project Draft Design at: <http://www.ieso.ca/-/media/Files/IESO/Document-Library/engage/esag/esag-20200218-draft-design-document.pdf?la=en>.

⁸ EFORD is a measure of the probability that a Capacity Storage Resource will not be available to operate due to a forced outage when there is demand on the capacity resource to generate. A set value of 5% will be used to account for the limited availability of historical data. The IESO will explore whether this value needs to be updated in the future as the historical data become available.

5.2.1 Dispatchable Capacity Storage Resources

Decision

Dispatchable Capacity Storage Resources will be qualified using the following equation:

$$UCAP (MW) = \left[\min \left(\text{Full Power Operating Mode}, \frac{\text{Energy Rating (MWh)}}{4 \text{ hrs}} \right) \right] * (1 - EFORD)$$

where, Energy Rating = Upper Energy Limit⁸ × Cycle Efficiency.

The IESO will request the following information to determine the ICAP of dispatchable Capacity Storage Resources:

- 1) The temperature-sensitive Full Power Operating Mode (in MW) sustained for 1 hour,
- 2) Energy Rating: The temperature-adjusted maximum amount of energy (in MWh) that the resource is capable of delivering, when it is fully charged, as defined below.

The Qualification process will consider the output that can be sustained for 4 hours. Therefore, qualification will be determined by the lower of maximum power rating or the energy rating divided over 4 hours. The value determined above will then be adjusted by its EFORD_d (set to 5%⁹) to determine its UCAP.

For resources that are temperature sensitive, Upper Energy Limit, Full Power Operating Mode, and Cycle Efficiency will be calculated at the seasonal zonal temperatures (July for Summer and January for Winter). The temperature used will be selected by the IESO and will be published in the pre-auction report.

⁸ Full Power Operating Mode, Upper Energy Limit and Cycle Efficiency are proposed registration data in the Energy Storage Design Project. If these data are unavailable, these may be requested as part of a capacity qualification request.

⁹ EFORD is a measure of the probability that a Capacity Storage Resource will not be available to operate due to a forced outage when there is demand on the capacity resource to generate. A set value of 5% will be used to account for the limited availability of historical data. The IESO will explore whether this value needs to be updated in the future as the historical data become available.

5.2.2 Self Scheduling Capacity Storage Resources

Decision

Self Scheduling Capacity Storage Resources will be qualified using the following equation:

UCAP (MW) = Average of up to 5 years of historical production selected from the hours coincident with the four consecutive hours of highest Ontario grid demand within the qualification window, from each business day, within each obligation period.

Self-Scheduling Capacity Storage Resources will be qualified by using the resources' production data. Where available, 5 years of data will be used, or a period of less than 5 years when a resource has been in operation for a smaller period of time. The historical production data is gathered from the IESO's records of hourly average quantity of energy injected to the grid.

The qualification window is described in detail in Appendix A, and the parameters will be published in the pre-auction report.

5.3 System-Backed Capacity Import Resources

Decision

System-Backed Capacity Imports will be qualified by:

UCAP=ICAP=Submitted Quantity

Imports from System-Backed Capacity Imports are anticipated to be fully reliable as these are guaranteed by the external power system (i.e., the neighbouring jurisdiction where they originate) to be available to meet Ontario's resource adequacy needs and will represent only a small portion of the overall external control areas total generation capability. Therefore, the qualified capacity of imports from System-Backed Capacity Imports will be taken as submitted for qualification and the entire amount will be assumed to be able to be injected at the border.

5.4 Generator-Backed Capacity Import Resources

Decision

Generator-Backed Capacity Imports will be qualified using the same methodology as the corresponding resource type located in Ontario.

Imports from Generator-Backed Capacity Imports are supported by a specific resource in the external jurisdiction, which will need to be individually assessed. These resources will be subject to the same capacity qualification assessment applied to that specific resource type located in Ontario. Generator-Backed Capacity Imports such as DR, coal as well as any resource types that are in-eligible in Ontario will not be qualified.

While the assessment for Ontario resources that have previously participated in the IESO's energy market makes use of data that already exists in the IESO systems, Generator-Backed Capacity Imports will be required to submit to the IESO this data as part of their capacity qualification request. For example, thermal generation facilities will be required to submit historic outage data, production data and derating curves to the IESO. This IESO may require that this data be validated or verified by the relevant balancing authority.

5.5 Demand Response Resources

A DR resource does not produce energy. Instead, it responds to market or dispatch signals to reduce consumption. There are two types of demand response resources that participate in the capacity auction:

- Capacity Dispatchable Load Resources
- Hourly Demand Response Resources

5.5.1 Capacity Dispatchable Load Resources

Decision

Capacity Dispatchable Load Resources will be qualified using the following equation:

UCAP (MW) = Average of up to 1 year of historical dispatchable energy market bids from the hours coincident with the four consecutive hours of highest Ontario grid demand within the qualification window, from each business day, within each obligation period.

Capacity Dispatchable Load Resources will be qualified by using the resources' bid data from the last year, during the qualification window. These bids indicate to the IESO the availability of the resource, and are suitable for estimating future availability. The Qualification Window is described in detail in Appendix A, and will be published in the pre-auction report.

5.5.2 Hourly Demand Response (HDR) Resources

Decision

HDR resources will be qualified by:

$$UCAP=ICAP=Submitted\ Quantity$$

HDR resources will provide, as part of the capacity qualification request, their qualified capacity. Submitted Quantity will be accepted as the qualified capacity with the following rationale:

- HDR resources' ability to reduce consumption is not materially impacted by fuel availability (unlike wind/solar or hydro resources), forced outages (unlike thermal resources) or state of charge (unlike storage resources);
- Historical availability or historical performance may not be indicative of future performance for all types of demand response;
- Given that HDR aggregators can change their portfolio of contributors significantly over different commitment periods, historical data may not be an appropriate parameter to be used to qualify these resources.

In addition to the above, the enhanced performance assessments framework is expected to provide sufficient drivers for good performance without further capacity qualification deratings. Future enhancements to the qualification methodology for demand response resources will be coordinated through the Demand Response Working Group (DRWG), and could be implemented for capacity auctions beyond March 2021.

5.6 Consolidated Capacity Auction Resources (CARs)

A consolidated CAR will receive a single qualified capacity value, rather than a separate qualified capacity values for each energy market resource mapped within the consolidated CAR. If a facility has multiple operationally inter-dependent energy market resources (e.g. combined cycle facility), the performance will be assessed as an entire registered facility, rather than qualifying each resource independently and

summing up the individual qualified capacity values, to inform the final qualified capacity value for the consolidated CAR.

5.7 Anticipated Document and Tool Impacts

Impacted Market Rules

Market Rules	Description of Change
Chapter 11, Definitions	Replace definition of 'enrolled capacity' with 'qualified capacity'
Chapter 7, Section 18	Revise section 18.2' Participation in Capacity Auctions' to describe that each participant must receive a qualified capacity amount from the IESO to participate in an auction Replace references to 'enrolled capacity' with 'qualified capacity' Revise section 18.5 to stipulate that the IESO will publish the timelines associated with the capacity qualification process and that capacity qualification information will be included in the pre-auction report.

Impacted Market Manuals

Market Manuals	Description of Change
Market Manual 12 Capacity Auctions	Replace section 3.2 Capacity Enrollment with Capacity Qualification Include in this section with the information that a CAP must submit in a capacity qualification request Describe the capacity qualification assessment that the IESO will complete for each CAR

Other Impacts

Other Impact (IT Tool, Reporting, etc.)	Description of Change
Online IESO	Create a series of new screens within the action 'Submit Capacity Qualification Request' to allow participants to submit the required data after having identified their CAR Update the screens related to capacity auction deposits to allow a participant to identify the deposit associated with each capacity action resource and allow them to reduce the deposit (and thereby signal they intend to offer an amount less than their qualified capacity) Update records to allow participants to view their qualified capacity for each CAR

6. Market Power Mitigation Process

For competitiveness and cost-effectiveness of the electricity system, the IESO will be introducing a Market Power Mitigation (MPM) process in the March 2021 Capacity Auction. Markets are successful when there is an open and fair competition among participants. When competition is restricted, market participants can exercise their ability to influence the clearing price (called “market power”). Competitive capacity auctions will provide incentives to submit auction offers that are consistent with the cost of providing capacity. Auction offers above this cost could result in increased auction clearing prices, and higher costs for consumers. This chapter will focus on the proposed design of the supplier-side MPM for March 2021 Capacity Auction. It aims to prevent suppliers who are pivotal to the success of the auction from offering at prices that would result in increases in auction clearing price above competitive levels.

Approach in the June 2020 Capacity Auction

Not applicable.

Approach in the March 2021 Capacity Auction

Decision

The IESO will perform an MPM process to mitigate the potential for economic withholding by organizations identified as having market power in the March 2021 Capacity Auction.

The MPM process will be introduced in March 2021 Capacity Auction to mitigate the potential for economic withholding, i.e., the submission of the auction offer above cost to increase clearing prices to benefit the remainder of the participant’s portfolio.

The methodology to mitigate the potential for economic withholding are divided into two parts:

1. The test for the ability to economically withhold (or have market power) based on the 1-firm Pivotal Supplier Test¹⁰; and

¹⁰ See section 6.2.2. for the definition and detail.

2. Mitigation measures applied in the form of an offer cap to the Capacity Auction Offers of the Capacity Auction Resources (CARs) under the control of the Capacity Auction Control Entities¹¹ (CACEs) that are detected by the 1-firm Pivotal Supplier Test as having market power.

For the CARs under control of the CACEs that are not detected to have market power (as per outcomes of the 1-firm Pivotal Supplier Test or are exempted as per section 6.1.), Capacity Auction Offers can be submitted up to the Maximum Auction Clearing Price.

Unlike economic withholding, physical withholding occurs when a CACE fails to offer a portion or all of the capacity available to it into a Capacity Auction, resulting in higher auction clearing prices. Physical withholding is typically mitigated in other markets through the introduction of an auction must-offer obligation for any CAR. Because participation in the Capacity Auction is currently voluntary, issues surrounding physical withholding are out-of-scope for March 2021 Capacity Auction.

6.1 Exemptions

The MPM process will apply to all CARs except the New CARs and the CARs meeting the exemption conditions specified below in the Small Fish Threshold or Exemption by Resource Type sections.

6.1.1 New Capacity Auction Resources (CARs)

For the purpose of the MPM exemptions, the IESO will consider new CARs to be the resources that have not been previously registered in the IESO-administered markets at the start of the Capacity Qualification process for the corresponding Capacity Auction.

6.1.2 Small Fish Threshold

The Small Fish Threshold, denoted in MW, is established by the IESO and will be used to exempt all CACEs from market power mitigation when the MWs registered for participation in the Capacity Auction as CARs under their control is smaller than this threshold.

For the March 2021 Capacity Auction, the IESO-established Small Fish Threshold will be 100 MW of installed capacity (ICAP). It will be applied by considering the total ICAP registered in the Capacity Auction under the control of the CACE.

When a CAR is controlled by more than one CACE, the IESO will assume the entire ICAP associated with that CAR is under the control of each CACE (i.e. the IESO will not split the ICAP for each CACE). If any of

¹¹ See section 6.2.1. for the definition and detail.

the CACEs that has control over the CAR is not exempted under the Small Fish Threshold provision, it follows that the IESO will not exempt the individual CAR under the Small Fish Threshold provision.

Due to the time constraints on the determination of Qualified Capacity (QC) for the March 2021 Capacity Auction, the IESO will base the Small Fish Threshold exemption determination on the ICAP value, as determined by the IESO (or the submitted capacity value in the case of demand response resources or system-backed imports) for each CAR. CAPs will be notified of the exempted CARs in their control before the Resource-Specific Offer Cap request submission window closes (i.e. during the pre-auction period after the CAPs submit information about the CACEs and the CARs under their control). The IESO will confidentially notify all CAPs of their CARs under their ownership that will be exempted from the market power mitigation.

The Small Fish Threshold would only exempt small CARs which according to the IESO's evaluation are identified as not posing a significant risk of possessing market power. There is no theory or widely-used approach in other markets, which guides the selection of an appropriate Small Fish Threshold. It is a balance between administrative simplicity and the consequences of the exercise of market power. The proposed threshold is based on the IESO's analysis conducted by examining market shares for existing capacity resources and assessing market power mitigation outcomes under different market conditions.

The IESO will re-visit the system-wide Small Fish Threshold and the need to potentially introduce the zonal Small Fish Thresholds before each future Capacity Auction.

6.1.3 Exemption by Resource Type

All resource types eligible for participation in the Capacity Auction will be subject to the 1-firm Pivotal Supplier Test with the exception of Imports. All imports, both generator-backed and system-backed, will be exempted from the MPM testing for the March 2021 Capacity Auction as those resources are considered to not pose a significant risk of possessing market power based on the eligible volume of import capacity MW (i.e. global import limit).

The IESO will monitor and evaluate the need to subject Imports to the MPM measures based on its expectations of the system requirements in subsequent capacity auctions.

6.2 Determination of Market Power

The first part of the methodology used to mitigate potential economic withholding will be conducting the 1-firm Pivotal Supplier Test ahead of each auction.

The 1-firm Pivotal Supplier Test is a structural test that assesses the potential for the exercise of unilateral¹² market power. The results of the 1-firm Pivotal Supplier Test will determine which, if any, controlling entities have the ability to economically withhold, and thus have market power. If the test indicates that the controlling entity has the ability to economically withhold their associated CARs, the CAPs will have to submit Capacity Auction Offers below the applicable offer cap (discussed in [Section 4.3](#)).

6.2.1 Capacity Auction Control Entity

CAP is the owner of the CARs but may not necessarily be the entity that controls the Capacity Auction Offers of all of its registered CARs. To effectively conduct market power mitigation process, the IESO requires information as to who controls a CAR's Capacity Auction Offers. This information will be submitted to the IESO at the same time as Capacity Qualification.

All CAPs are required to disclose all entities that have capacity auction control over the CARs in their ownership. Capacity auction control is the ability to set the price or quantity of a CAR's Capacity Auction Offers made to the Capacity Auction. Therefore, a CACE is an entity that has the ability to set the price or quantity of the CAR's Capacity Auction Offers made into the Capacity Auction by the CAP. See Appendix B for definition of CACE.

The market power mitigation exemptions and 1-firm Pivotal Supplier Test will be based on the total MW of capacity controlled by the CACE, and not the CAP's total CARs registered in the Capacity Auction. For the cases where a CAR is controlled by more than one CACE, the full capacity (MW) associated with that CAR will be accounted in calculating Small Fish Exemptions and 1-firm Pivotal Supplier Test for each of the CACEs that has control over that CAR.

¹² Exercise of market power on a unilateral basis is when a single CACE raises auction prices by offering at prices above their going-forward costs to the benefit of their portfolio. The CACE can exercise its market power through the CARs it has control over, for which the CAP submits offers.

6.2.2 1-Firm Pivotal Supplier Test

The 1-Firm Pivotal Supplier Test will be conducted for each Obligation Period in two sequential and independent steps:

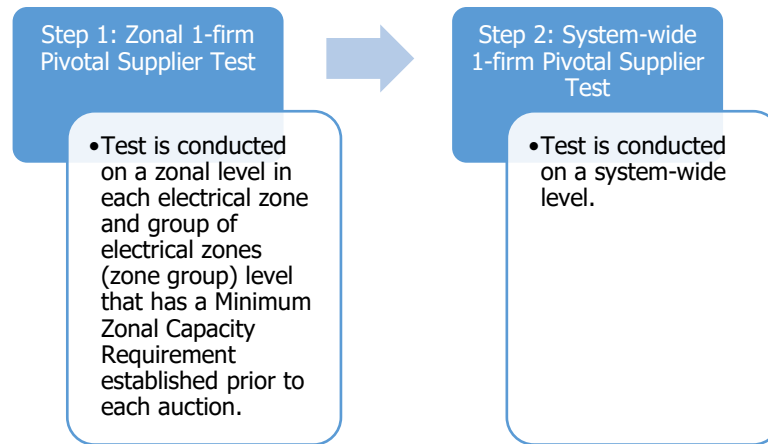


Figure 4 | Two Steps of the 1-Firm Pivotal Supplier Test

6.2.3 Zonal 1-firm Pivotal Supplier Test

The zonal 1-firm Pivotal Supplier Test will be conducted in any single zone or a group of zones (i.e., zone-group) for which the Zonal Minimum Capacity Requirements were established by calculating zonal CACE's Residual Supply Index (RSI) – Single-Zone and Zone-Group CACE's RSI - for each of the two Obligation Periods.

For clarity, the IESO will conduct zonal 1-firm Pivotal Supplier Test if Zonal Minimum Capacity Requirement is established for either both – a single zone and any group of zones – or separately for any zone or group of zones only.

If there are no Minimum Zonal Capacity Requirements established for any zone or group of zones (i.e. 0 MWs) for the Capacity Auction summer or winter obligation period, the zonal 1-firm Pivotal Supplier Test will not be conducted for that obligation period. In that situation, the IESO will proceed with conducting System-wide 1-firm Pivotal Supplier Test only.

The zonal 1-firm Pivotal Supplier Test will use total qualified capacity controlled¹³ by the CACE in the zone or group of zones where test is being conducted. If there are Imports or New CARs under CACE's control, only Imports will be accounted for in the Single-Zone or Zone-Group CACE's Qualified Capacity for the

¹³ See Section 6.2.1 for the definition of capacity auction control of the CACE.

purpose of Zonal 1-firm Pivotal Supplier Tests. If the CACE is subject to mitigation in the result of the 1-firm Pivotal Supplier Test, Imports will be exempted from the mitigation (i.e., an offer cap) as described in Section 6.1.

The calculated Single-Zone and Zone-Group CACE's RSI is compared to Zonal RSI threshold of 1.

A Zonal RSI threshold of 1 indicates that 100% of zonal minimum capacity requirement needs to be covered by the excess qualified capacity in the zone or group of zones coming from CARs controlled by other CACEs than the CACE that is being tested. The IESO will monitor and evaluate the need to periodically change Zonal RSI threshold of 1 with the potential need to differentiate RSI threshold by zones and groups of zones based on its expectations of the supply and demand conditions for each Capacity Auction.

If Single-Zone and Zone-Group CACE's RSI ratio is greater than the corresponding Zonal RSI threshold, the CACE passed the Zonal 1-firm Pivotal Supplier Test in that zone or group of zones. Failure of the Zonal 1-firm Pivotal Supplier Test will mean resources within that zone or group of zones are to be mitigated.

$$\begin{aligned}
 & \text{Single – Zone Capacity Auction Control Entity's RSI} \\
 = & \frac{\text{Total SingleZone Qualified Capacity – SingleZone Capacity Auction Control Entity's QC}}{\text{Minimum Zonal Capacity Requirement}_{\text{Single-Zone}}} \\
 & \text{Zone – Group Capacity Auction Control Entity's RSI} \\
 = & \frac{\text{Total ZoneGroup Qualified Capacity – ZoneGroup Capacity Auction Control Entity's QC}}{\text{Minimum Zonal Capacity Requirement}_{\text{Zone-Group}}}
 \end{aligned}$$

6.2.4 System-wide 1-firm Pivotal Supplier Test

The system-wide 1-firm Pivotal Supplier Test will use total qualified capacity controlled by the CACE in the Capacity Auction for which the test is being conducted.

The system-wide 1-firm Pivotal Supplier Test will be conducted by calculating the System-wide CACE's RSI for each of the two Obligation Periods. If there are Imports or New CARs under CACE's control, only Imports will be accounted for in the System-Wide CACE's Qualified Capacity for the purpose of System-wide 1-firm Pivotal Supplier Test. If the CACE is subject to mitigation in the result of the 1-firm Pivotal Supplier Test, Imports will be exempted from the mitigation (i.e., an offer cap) as per section 6.1.

The calculated System-wide CACE's RSI is compared to System-wide RSI threshold of 1.

If System-wide CACE's RSI ratio is greater than the System-wide RSI threshold of 1, the participant is considered to "pass" the test.

System – wide Capacity Auction Control Entity's RSI

$$= \frac{\text{Total Qualified Capacity} - \text{Total Capacity Auction Control Entity's QC}}{\text{Target Capacity}}$$

Further Details of zonal and system 1-firm Pivotal Supplier Test are found in Appendix B.

6.3 Market Power Mitigation Mechanisms

The market power mitigation process to test for potential economic withholding will apply to all CARs not exempted by the Small Fish Threshold or by the exempted Resource Type(s).

6.3.1 Offer Cap

CAPs identified by the 1-firm Pivotal Supplier Test as having the ability to economically withhold (see Section 6.2.2 above), will be required to submit offers into the Capacity Auction at or below an established Default Offer Cap (see Section 6.3.2.) or, if requested and approved, a Resource-Specific Offer Cap (see Section 6.3.3). This is the second part of the methodology used to mitigate potential economic withholding.

6.3.2 Default Offer Cap

The Default Offer Cap is the uniform auction offer price cap applicable to all CARs under the Capacity Auction control of a CACE that fails the 1-firm Pivotal Supplier Test. This cap will be denoted by \$/MW-day and will be published prior to each Capacity Auction as a part of the pre-auction report.

The Default Offer Cap will be set at a level below the Maximum Auction Clearing Price.

In line with the Reference Price, the IESO will set a single seasonally non-differentiated Default Offer Cap for both summer and winter Obligation Periods. The IESO will revisit the need for seasonal Default Offer Cap if experience with earlier Capacity Auction results after March 2021 Capacity Auction demonstrate large persistent seasonal pricing differences. See Appendix B for more detail on this methodology.

6.3.3 Resource-specific Offer Cap

To account for resource-specific costs that are higher than the Default Offer Cap, a CAP can submit a Resource-Specific Offer Cap request for the IESO review through the process described in the Appendix B.

Resource-Specific Offer Cap must be requested by the CAP prior to the deadline during the pre-auction period and will be calculated for each Obligation Period and, if applicable, for contingent offer configuration, separately.

6.3.4 Resource-Specific Offer Cap Request

A CAP will be permitted to submit a request for a Resource-Specific Offer Cap if the CAP does not believe that its resource can recover its costs of meeting the Capacity Obligation with the Default Offer Cap established by the IESO (as per Section 6.3.2 above).

CAPs will be permitted to submit a Resource-Specific Offer Cap request after they register as CAP and submit CACE data (as per Section 6.2.1). Such requests, along with required supporting documentation, must be submitted within the pre-defined Resource-Specific Offer Cap request submission window, which will take place approximately 10 weeks before the auction offer submission window opens.

The IESO will specify required data and acceptable supporting documentation for submission in the Market Manuals. Submitted through this process resource-specific capacity cost data will be used for the market power mitigation processes, specifically for calculating the Resource-Specific Offer Caps.

The review process will be conducted by the IESO. The IESO may request additional information or clarification during the approximately 10-week review process. The IESO will communicate the private results of the review process to CAPs at least two weeks prior the auction. Such results will include:

- a) If request is approved on the basis of the submitted data and supporting documentation, the applicable Resource-Specific Offer Cap value;
- b) If request is denied on the basis of the submitted data and supporting documentation, an explanation why the request was denied.

Generation Facilities

For capacity generation, the CAP's plan in case the CAR does not clear the Capacity Auction and does not receive a Capacity Obligation will drive the choice of one of four types of the Resource-Specific Offer Cap requests that can be submitted.

The CAP must submit its request along with supporting documentation. This documentation states which of the following four types of the Resource-Specific Offer Caps is applied in each obligation period and, if applicable, for contingent offers:

1. **Energy-only No-Capacity Obligation Offer Cap** – applicable to CARs that will continue operating in the energy and ancillary services market if they do not clear the Capacity Auction.
2. **Export Offer Cap** - applicable to the CARs that will temporarily export capacity to neighboring market if they do not clear the Capacity Auction. This implies that the resource will come back

online in a later year and offer into the Capacity Auction. A resource may choose to export in only one Obligation Period.

3. **Mothball Offer Cap** – applicable to the CARs that will temporarily cease operations (i.e., mothball) if they do not clear the Capacity Auction. This implies that the resource will come back online in a later year and offer into the Capacity Auction. A resource may choose to be mothballed only for one Obligation Period.
4. **Deregistration Offer Cap** – applicable to CARs that will permanently deregister if they do not clear the Capacity Auction, which implies that it will not return to service in future years.

Demand Response Resources

Demand Response CARs – Hourly Demand Response (HDR) Resources and Dispatchable Load (DL) Resources - will have only one Resource-Specific Offer Cap type applicable to them:

- Demand Response Offer Cap.

CAPs that offer DR resources must inform the IESO prior to the Capacity Auction, at the time the Resource-Specific Offer Cap request is submitted, whether or not the DR resources will cease operations if they do not clear the Capacity Auction.

If a CAP has multiple DR resources in its portfolio, it will need to submit a separate Resource-specific Offer Cap request for each of the DR resources registered as a CAR that wants to request a Resource-Specific Offer Cap. See Appendix B for detail on the calculation methodology for Resource-Specific Offer Caps.

6.3.5 MPM-related Post-Auction Reporting

The IESO will include the following MPM-related auction statistics into the Public Capacity Auction Post-Auction Report:

- a) Aggregate amount of MWs of the CARs that requested Resource-Specific Offer Caps grouped by the Resource-Specific Offer Cap type
 - a. Amount of MWs for which the requests were approved
 - b. Amount of MWs for which the requests were denied
- b) Aggregate amount of MWs of the CARs that were subject to mitigation based on the outcome of the 1-firm Pivotal Supplier Test
 - a. On a system-wide basis, and
 - b. On a zonal basis (if zonal 1-firm Pivotal Supplier Test was conducted in the auctions when zonal minimums are available)

The specific results of the MPM outcomes will be communicated to participants in a confidential report.

6.4 Anticipated Document and Tool Impacts

Impacted Market Rules

Market Rules	Description of Change
Chapter 7, Section 18	Add new section to codify the MPM process.
Chapter 11	Add new defined terms to support the MPM process established in Chapter 7, section 18:1-firm pivotal supplier test, Capacity Auction Control Entity (CACE), default offer cap, resource specific offer cap, small fish threshold

Impacted Market Manuals

Market Manuals	Description of Change
Market Manual 12	Add new section to codify the MPM process. Update existing sections to incorporate MPM processes.

Other Impacts

Other Impact (IT Tool, Reporting, etc.)	Description of Change
Pre-Auction Report	Add MPM-related auction parameters.
Post-Auction Report	Add MPM-related auction outcome statistics.
Online IESO	Enable submission of MPM-related information.

7. Pre-Auction Period

The Pre-Auction Period is the first period in an auction cycle. During this period, prospective auction participants and the IESO perform various tasks to ensure that the necessary inputs are prepared to conduct the Capacity Auction as shown in the diagram below. This chapter provides details regarding activities conducted during the Pre-Auction Period of the Capacity Auction (see Figure 5).

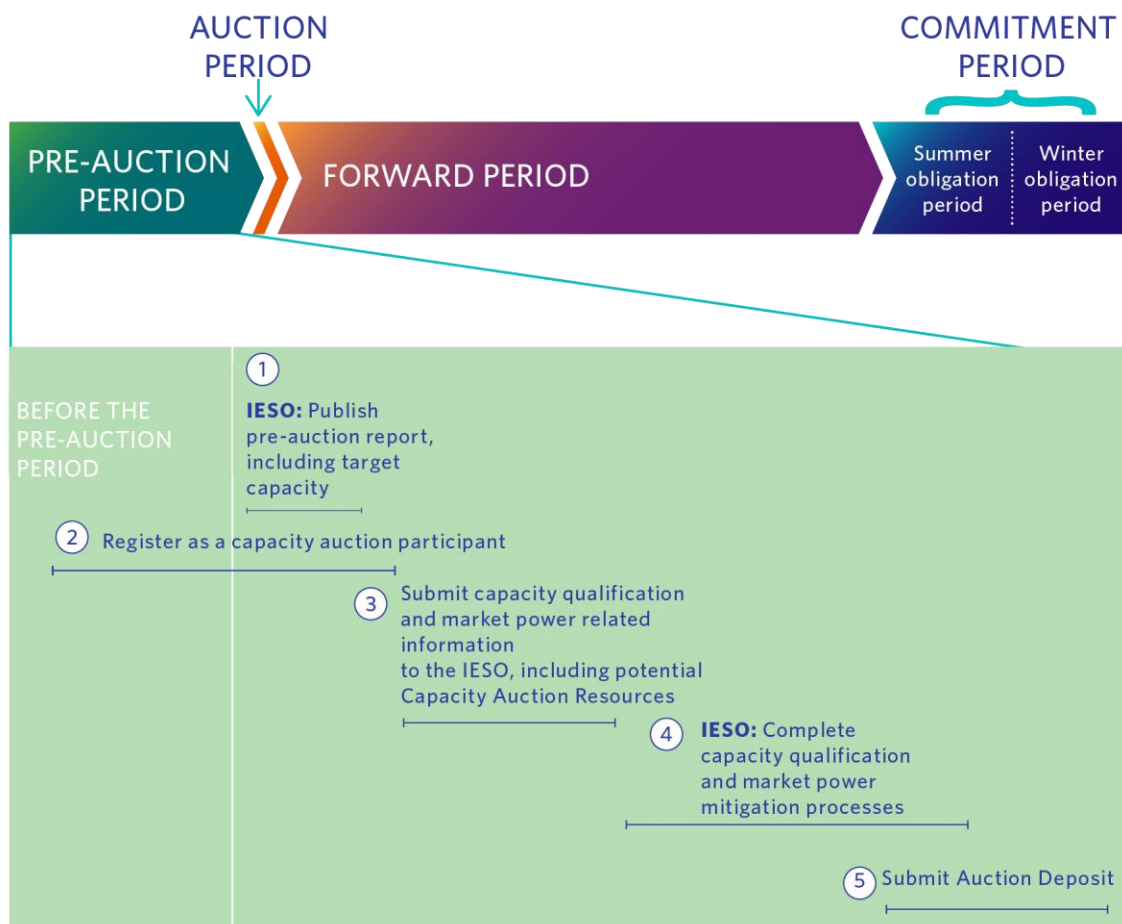


Figure 5 | Pre-Auction Period Activities

7.1 Determination of Auction Parameters

Prior to developing the pre-auction report, the IESO determines the auction parameters, specifically the demand curve and any additional constraints which will be used to assess offers for optimality.

An auction demand curve is a representation of the IESO's willingness to acquire auction capacity and defines the prices that the IESO is willing to pay for varying levels of auction capacity.

The IESO uses a downward-sloping demand curve for the Capacity Auction. The most fundamental element of the design curve is the reference price. This sets the price the IESO is willing to pay to acquire the target capacity and also represents the price at which resources are incented to enter the market.

The key reference points on the downward-sloping curve include:

- **Target Capacity (MW)** represents the amount of Capacity that the auction seeks to clear. As described below, if local requirements or constraints are required for a particular region of the province, zonal minimums and/or maximums may be defined.
- **Reference Price**, denoted by \$/MW-day, is associated with the Target Capacity MW quantity and reflects the estimated capacity revenue necessary to support a hypothetical long-run marginal resource to make their capacity available to Ontario.
- **Maximum Auction Clearing Price** sets a limit on the price at which the auction will compensate successful resources for their capacity.
- **Maximum and Minimum MW capacity limits** define the range of capacity (MW) within which the auction will be permitted to successfully clear.

The slope of the demand curve will be shaped by the reference points (shown above). The selection of the reference points will have an impact on the outcome of the auction, with respect to the value of Capacity, as well as the auction's ability to signal appropriate investment decisions for resources.

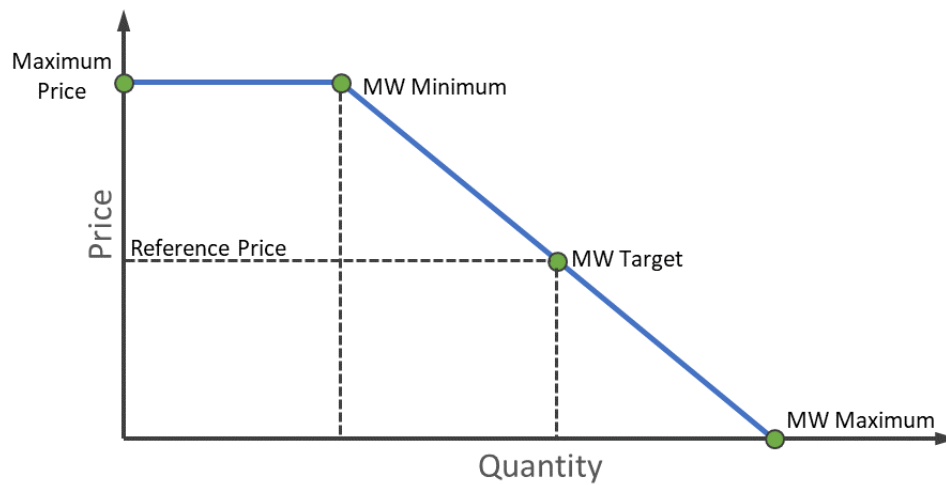


Figure 6 | Sloped Demand Curve

Approach in the June 2020 Capacity Auction

In the June 2020 Capacity Auction, parameters are grouped into three categories: (1) Demand Curve Parameters; (2) Zonal Constraints; and (3) Import Constraints.

Demand Curve Parameters:

- Reference Price
- Target Capacity
- Maximum and Minimum Auction Clearing Price
- Capacity Limits (the minimum capacity, the maximum capacity at maximum Capacity Auction Clearing Price, and the maximum capacity).

Zonal constraints:

- Total Zonal Capacity Limit Minimum (MW)
- Total Zonal Capacity Limit Maximum (MW)
- Virtual Zonal Capacity Limit Maximum (MW)

Capacity Import Constraints:

- Maximum Auction Import Capacity Limit (MW)
- Maximum Interface Capacity Limit (MW)

Approach in the March 2021 Capacity Auction

Decision

Starting with the March 2021 Capacity Auction, zonal constraints related to a group of zones (zone group) will be introduced, in addition to constraints for single electrical zones.. Zone groups will have their own respective minimum and maximum total limits.

The values for the target capacity (and therefore the capacity limits), Reference Price and Maximum Auction Clearing Price will also be reviewed and revised as required to support reliability.

Reference Price

Approach in the June 2020 Capacity Auction

The Reference Price is \$413 per MW-day. This value is based on the cost of DR resources previously contracted with the IESO.

Approach in the March 2021 Capacity Auction

Decision

In the March 2021 Auction, the Reference Price will be revised to \$570 per MW-day in \$2021.¹⁴

The Reference price of \$570 is based on the all-in levelized cost (net of energy and ancillary market earnings) of a single cycle gas CT plant. It reflects the long-run marginal cost of capacity and allows for all supply with cost up to this level to participate before a theoretical new build option as the proxy resource. Although the Capacity Auction is not intended to entice a new gas plant, a single cycle gas CT is the lowest cost form of capacity in Ontario and represents an opportunity cost which ratepayers are willing to pay to maintain resource adequacy.¹⁵

Maximum Auction Clearing Price

The Maximum Auction Clearing Price (MACP) is the highest price at which an auction can clear (i.e., the “price cap”). It is expressed as a multiple of the Reference Price.

¹⁴ This level will be updated annually based on the Statistics Canada gross domestic product (GDP) deflator index (i.e.- \$580/MW-day for 2022)

¹⁵ Using a Net CONE value as the basis for setting the Reference Price of the demand curve does not mean the pricing outcomes of the auction would be biased toward the cost of new resources.

Approach in the June 2020 Capacity Auction

The Maximum Auction Clearing Price is set at a multiple of 1.25 times the Reference Price. This equates to a cost of ~\$516 per MW-day or ~\$130,000 per MW-year, which is also the Long-Term Energy Plan's forecasted net cost of a new Single Cycle Gas Turbine generator.

Approach in the March 2021 Capacity Auction

Decision

The Maximum Auction Clearing Price will be revised to a multiple of two times the Reference Price.

This equates to \$1140 per MW-day in \$2021. Based on more detailed modeling and experience from other jurisdictions, a range of 1.5 to 2 times Reference Price is expected to be needed in an annual capacity auction to support reliability requirements and account for potential error in estimating the Net CONE value. An additional multiple on the high end of that range will also be required due to the unique circumstances faced in Ontario including:

- somewhat greater uncertainty in the cost of incremental supply with the given lack of experience with merchant generation entry and the lack of a detailed Net CONE study by electrical zone,
- the potential need to set the MACP at a level that will allow prices to rise sufficiently in the tighter summer season to be able to cover most of the costs of an annual resource in just one season,
- Regional differences in the net CONE value.

Target Capacity

The Target Capacity is the minimum amount of auction capacity which the IESO seeks to acquire through a capacity auction. The IESO will set a Target Capacity for each Obligation Period.

Approach in the June 2020 Capacity Auction

As the Planning Coordinator for Ontario, the IESO conducts ongoing long-term planning, culminating each year in the publication of the [Annual Planning Outlook \(APO\)](#). The APO aims to transparently inform stakeholders of the total resource requirement, based on a resource adequacy criterion. This criterion is a key element for ensuring the reliability of Ontario's electricity system. Therefore, the target capacity must be at least the total resource requirement, less the capacity that is already anticipated to be available in a given year (i.e. contracted and rate regulated capacity).

Assuming existing resources remain available, the IESO's 2019 Annual Planning Outlook confirmed that a capacity need of approximately 2,000 megawatts (MW) emerges in 2023. In Spring 2019, the IESO worked with stakeholders to identify a pragmatic way of incenting resources to make themselves available when the resource adequacy shortfall is significant. This allows the IESO to set the Target Capacity in a capacity auction greater than the individual year's capacity need – allowing some resources to stay online, expanding their contributor base, or making other advantageous business decisions in the short-term. These short-term decisions may drive greater competition in the capacity auctions over the long term.

Approach in the March 2021 Capacity Auction

Decision

The IESO will consider the reliability requirements stipulated in the Annual Planning Outlook for the commitment period, as well as longer term reliability assurance needs to determine the target capacity.

7.2 Public Pre-Auction Reporting

The IESO will provide the necessary information in advance of each auction to help auction participants prepare for participation in the upcoming auction.

Approach in the June 2020 Capacity Auction

The IESO posts a pre-auction report at least two months prior to the Capacity Auction. All of the information contained in the Demand Response Auction Pre-Auction Report continues to be included in the June 2020 Capacity Auction pre-auction report with the addition of import related constraints. The pre-auction report is posted on the [Reports](#) section of the IESO website. This report includes the following parameters for each Obligation Period:

- Target Capacity,
- Capacity Auction Reference Price,
- Minimum and maximum Capacity Auction Clearing Prices,
- Minimum (historically set at 0 MW) and maximum auction capacity limit,
- Maximum auction capacity at the maximum Capacity Auction Clearing Price,
- Capacity constraints for each electrical zone,

- External Interface Limits,
- Global Import Limit,
- Key milestone dates, and
- A link to the IESO's zonal map tool.

Approach in the March 2021 Capacity Auction

Decision 1

The March 2021 pre-auction report will contain additional information related to the Market Power Mitigation process explained in [Section 4](#)

Decision 2

The March 2021 pre-auction report will contain qualification related parameters such as the qualification windows, default EFOR_d for Capacity Storage Resources, resource fleet average EFOR_d, and zonal reference temperature.

Decision 3

The IESO will introduce zone groups into the constraints section of the pre-auction report. Where multiple zones may be considered together as a 'group' these will be listed as an additional constraint.

Decision 4

As described in Section 2.1, the pre-auction period will be lengthened. Therefore, the pre-auction report will be made available approximately five months prior to the start of the auction.

The pre-auction report will be published on the [Reports](#) section of the IESO website, with the same title as the June 2020 Capacity Auction. Other information, such as timelines, will continue to be posted on the [Capacity Auction webpage](#).

Pre-Auction Report Market Power Mitigation Parameters:

1. Small Fish Threshold: Expressed in MW of installed capacity.
2. Default Offer Cap: Expressed in \$/MW-day
3. Residual Supply Index (RSI) Threshold: Expressed a dimensionless number.

Pre-Auction Report Capacity Qualification Parameters:

1. Default forced outage rates to be applied to resources with less than five years of production history
2. Temperatures to be used for assessing qualified capacity of thermal resources by zone and obligation period
3. Qualification window, in days per season and hours per day, to be used for qualifying hydroelectric resources and self-scheduling resources.

7.3 Authorization Process

The Authorization Process is the process through which prospective auction participants inform the IESO of their intent to participate, and through which the IESO authorizes participation in advance of an auction.

Approach in the June 2020 Capacity Auction

Participants must become authorized as a Capacity Auction Participant (CAP) to offer capacity into the auction.

Approach in the March 2021 Capacity Auction

Decision

The IESO will continue to use the market participant type CAP. All participants must authorize as a CAP to qualify resources and offer into the Capacity Auction.

7.4 Capacity Qualification

Approach in the June 2020 Capacity Auction

In the June 2020 Capacity Auction, CAPs are required to specify a single energy market resource (except for demand response resources that had not previously registered to participate in the energy market) as part of the capacity enrollment process and the amount of auction capacity they feel they are able to reliably offer. When a CAP specifies the energy market resource, the energy market resource is identified as a potential Capacity Auction Resource (CAR).” Energy market resources are not permitted to aggregate under a single CAR.

Approach in the March 2021 Capacity Auction

Decision 1

The capacity enrollment process will be renamed to capacity qualification.

Decision 2

CAPs will be required to specify the energy market resource(s) (if available) as part of the capacity qualification process. They will also be allowed to consolidate multiple resources from the same facility and of the same resource type, as registered with the IESO, into a single CAR as explained in [Chapter 3](#). The amount of auction capacity they are able to provide for the CAR will now be provided by the IESO via the Capacity Qualification Process outlined in [Chapter 5](#).

As part of the capacity qualification process, each CAP will identify whether an existing energy market resource(s) or a new energy market resource(s) (applicable only to DR) will be used for the CAR. For organizations qualifying existing market resources (i.e. resources that are registered in the IESO-Administered Market), they will identify the existing market resource(s), subject to the eligibility to participate in an upcoming Capacity Auction. When a CAP specifies the energy market resource(s), the energy market resource(s) will be identified as a potential "CAR." Depending on the type of resource, they will be required to submit additional information to the IESO. This information is specified Market Power Mitigation Process and Capacity Qualification Process.

7.5 Auction Deposit

Approach in the June 2020 Capacity Auction

Submission of a Capacity Auction Deposit is used to establish the creditworthiness of the participant for auction activities at the outset of an auction process, and to ensure that auction and Forward Period obligations can be satisfied. The deposit must be submitted by a CAP at least five business days prior to the start of the auction offer submission window. Failure to provide a deposit on time can result in disqualification from participating in an auction.

The deposit is in one (or a combination of both) of the following forms:

- Irrevocable commercial letter of credit, in a form acceptable to the IESO, provided by an IESO-approved bank, or
- Cash deposits made to the IESO by or on behalf of the authorized market participant. The IESO will not pay interest on cash deposits.

The deposit is estimated as a function of the total enrolled capacity submitted by the CAP and the maximum auction clearing price, as given below:

$$\text{Capacity Auction Deposit} = 3\% \times \text{Total Enrolled Capacity} \times \text{Max Auction Clearing Price per MW-day} \\ \times \text{\# business days in obligation period}$$

A higher deposit requirement may be imposed depending on the creditworthiness of the CAP in the IESO-Administered Markets.

Deposits received from successful auction participants are released, upon request, once:

- The CAP authorizes as a Capacity Market Participant,
- Sufficient prudential support is posted, and
- At least one resource is registered to meet the CAP's Capacity Obligation for each Obligation Period in each of the cleared electrical zones.

Deposits received from unsuccessful auction participants are released, upon request, after the publication date of the post-auction report.

In the case of a Capacity Obligation transfer, the IESO releases all or a portion of a capacity transferor's deposit, if requested and a set of criteria are met.

In order to release deposits, successful auction participants must meet the following requirements:

- The CAP also authorizes as a Capacity Market Participant,
- Sufficient prudential support is posted, and
- For Demand Response Resources that did not have an existing energy market resource during capacity enrollment, then at least one market resource must register during the forward period to meet the CAP's Capacity Obligation for each Obligation Period.

Approach in the March 2021 Capacity Auction

Decision

There will be no changes to the deadlines for collecting an auction deposit in the March Capacity Auction. The terminology used in the formula for determining the deposit will be updated to reflect the qualified capacity as calculated by the IESO. If a participant intends to offer less than the qualified capacity, they will be able to indicate this value to the IESO and receive a revised capacity auction deposit.

The terminology in the equation will be as follows:

$$\text{Capacity Auction Deposit} = 3\% \times \text{Total Qualified Capacity} \times \text{Max Auction Clearing Price per MW-day} \\ \times \text{\# business days in obligation period}$$

Where the Total Qualified Capacity is the summation of all capacity that was qualified by the IESO for the CAP during the Capacity Qualification process for every Capacity Auction Resource or potential Capacity Auction Resource. If a participant intends to offer less than its qualified capacity into the upcoming capacity auction, they will be able to identify this lesser amount during the pre-auction period and submit a smaller deposit amount. This lesser amount will be the maximum the participant may offer for the applicable capacity auction resource into the capacity auction.

7.6 Anticipated Document and Tool Impacts

Impacted Market Rules

Mark Rules	Description of Change
Chapter 11, Definitions	<ul style="list-style-type: none"> Update the definition of 'capacity auction zonal constraints' to include zone groups Update definition of 'capacity auction offer' to limit an offer to the percentage of qualified capacity for which a participant has submitted a deposit on
Chapter 7, Section 18	<ul style="list-style-type: none"> Update section 18.5 to identify new market power mitigation and capacity qualification parameters included in the pre-auction report

Impacted Market Manuals

Market Manual	Description of Change
Market Manual 12	<ul style="list-style-type: none"> • Update Section 3.3 Capacity Auction Deposit to describe how a participant may provide a lesser deposit than the amount based on the qualified capacity of resources • Revise Section 2.1 Capacity Auction Process to describe capacity qualification process • Revise Section 2.2 Capacity Auction Timelines to include timelines related to capacity qualification • Revise Section 2.5.2 Reference Price to acknowledge avoided costs in all IESO-administered markets • Revise Section 2.5.3 Maximum and Minimum Auction Clearing Price to stipulate the maximum is a multiple of 2 times the capacity auction reference price • Revise Section 2.5.5 Zonal Constraints to describe the grouping of zones • Revise Section 3.1 Pre-auction reporting Obligations to include market power mitigation and capacity qualification information

Other Impacts

Other Impact (IT Tool, Reporting, etc.)	Description of Change
Pre-Auction Report	<ul style="list-style-type: none"> • Include market power mitigation and capacity qualification information • Include zone groups
Online IESO	<ul style="list-style-type: none"> • See changes identified in Chapter 5 Capacity Qualification Process

8. Auction Period

The Auction Period is the length of time commencing with the opening of the window during which the IESO receives Capacity Auction offers, and finishing at the time at which the IESO publishes auction results. This chapter provides details regarding activities conducted during the Auction Period of the Capacity Auction (see Figure 7).



Figure 7 | Auction Period Activities

8.1 Offer Submission

The auction offer submission window is the period of time during which auction participants are permitted to submit offers into an auction.

Approach in the June 2020 Capacity Auction

The IESO is targeting the third Wednesday in June 2020 for the Capacity Auction. The length of time of the auction period remained unchanged, including the length of time for the offer submission window.

The format of Capacity Auction offers changed where separate Capacity Auction offers are required for each individual potential Capacity Auction Resource identified during the capacity enrollment process.

Capacity Auction Participants (CAPs) are required to submit Capacity Auction offers individually for each Capacity Auction Resource where they had previously offered at an organization level. By allowing offers on specific Capacity Auction Resources, the IESO allows an organization to submit offers for both load facilities and generation facilities within the same zone. This structure requires that CAPs select the Capacity Auction Resource and then meet the set of requirements regarding submission of Capacity Auction offers as follows:

- Offers will be submitted for each Obligation Period and applied for the entire Obligation Period.
- Submitted offers are for any quantity between 1 MW and the capacity registered in the pre-auction process, to one decimal place, and use offer laminations to reflect the price of providing the various levels of auction capacity.
- A complete Capacity Auction offer for each Capacity Auction Resource may make use of up to 20 monotonically increasing price-quantity pairs ("laminations"), with the total offered quantity across all laminations equal to or less than the enrolled capacity for that Capacity Auction Resource. The auction offer quantity must be entered as a cumulative value and therefore must increase with every new lamination.
- Each Capacity Auction offer has to specify, for each price-quantity pair, whether the entire capacity represented in the lamination must be cleared in full or whether it may be partially cleared. A full flag is an indication that the quantity of capacity offered in a given lamination must be fully selected or not selected at all. A partial flag indicated that all, part, or none of the capacity offered in a given lamination may be selected, to a granularity of 0.1 MW.

Approach in the March 2021 Capacity Auction

Decision

CAPs will be allowed to submit multiple offers with a single lamination each, however only one offer may clear in the auction. The restriction on the total number of laminations per potential Capacity Auction Resource will remain. This provision allows for aggregation of multiple metered units that are part of one facility, as well to assist participants in representing their resources' economies of scale. Participants will still have the ability to submit one offer with 20 monotonically increasing laminations.

Participants will also have the option to submit contingent offers (summer contingent and winter contingent) in addition to individual summer and winter stand-alone offers.

For Capacity Auction Resources subject to market power mitigation as a result of 1-firm Pivotal Supplier Test, all capacity auction offers must be submitted at or below the Default Offer Cap or, if applicable, the Resource-Specific Offer Cap.

Multiple Offers

As in the June 2020 auction, CAPs may submit offers with up to 20 laminations each in ascending order of price. For the March 2021 Capacity Auction, CAPs will also have an alternative option to submit up to 20 multiple mutually exclusive offers of one lamination each. Multiple offers must be submitted with a full offer flag only (i.e., cannot be submitted as partial offers).

To illustrate multiple offers, consider the following example:

- A CAP has the intention to offer 100 MW for \$10 and the next 50 MW for a cheaper \$8 because most of the fixed costs will be covered by the first lamination
- They could choose to submit the following multiple offers to represent the declining nature of their resource
 - Offer 1: 100MW for \$10
 - Offer 2: 150MW for \$9.33 (weighted average = $\frac{100MW \times \$10 + 50MW \times \$8}{100MW + 50MW}$)
- Each offer will consist of only one lamination
- The auction mechanism will select between Offer 1 and Offer 2 based on whichever maximizes the social welfare
- The following restrictions apply due to tie breaking limitations:
 - Prices across the 20 multiple offers from the same CAP must all be different

For Capacity Auction Resources subject to market power mitigation as a result of 1-firm Pivotal Supplier Test, all multiple offers must be submitted at or below the Default Offer Cap or, if applicable, the Resource-Specific Offer Cap.

Contingent Offers

Contingent offers will provide participants with the ability to offer into the auction in a manner that minimizes their risk of clearing in only one season and not obtaining the expected level of revenue, which in turn is expected to result in lower participant risk and provide for more competitive offers. This will allow participants to better represent their fixed annual costs by distributing these costs over the entire year. If the CAP wishes to submit a contingent offer, they must submit both a contingent summer and a contingent winter offer together (this validation will take place during offer submission). Both single offer and multiple offer submissions could utilize the flexibility of contingent offers. CAPs who wish to submit normal seasonal (stand-alone) offers as well are able to do so. CAPs are not required to submit all four types of offers at the same time. Contingent offers must be submitted with a full offer flag only (i.e., cannot be submitted as partial offers).

To illustrate contingent offers, consider the following example:

- A CAP offers the following offer,
 - Summer only: 100 MW for \$50
 - Winter only: 120 MW for \$40
 - Summer contingent: 100MW for \$30
 - Winter contingent: 120MW for \$20
- The summer and winter contingent offers are less expensive because the CAP would be guaranteed a revenue from both Obligation Periods instead of only one
- If the contingent offers do not clear because the resultant winter clearing price is lower than \$20 and it was uneconomical (or if the summer contingent offer was uneconomical), the auction engine still has the option to consider the stand-alone offers
- If the higher priced summer stand-alone offer (or vice versa the winter stand-alone) is still economical, then the resource will receive an obligation for the summer Obligation Period only
- In general, there are five possible mutually exclusive outcomes:
 - No offers accepted from this resource for both winter and summer
 - Summer only offer accepted

- Winter only offer accepted
 - Both summer and winter contingent offers accepted
 - Both summer and winter only offers accepted (only if they were priced lower than the contingent offers)
- The following restrictions apply due to tie breaking limitations:
 - The prices between stand-alone multiple offers within the same Obligation Period must be different for the same CAP
 - The pairs of contingent offers, meaning all four quantities (P_{sum} , Q_{sum} , P_{win} , Q_{win}), between two separate offers for the same CAR cannot be the same
 - The maximum quantity offered in an Obligation Period must be the same between the stand-alone and contingent offers ($Q_{\text{max-stand-alone-sum}} = Q_{\text{max-contingent-sum}}$)
- For Capacity Auction Resources subject to market power mitigation as a result of 1-firm Pivotal Supplier Test, all contingent offers must be submitted at or below the Default Offer Cap or, if applicable, the Resource-Specific Offer Cap.
- As both the Capacity Auction Participants and the IESO familiarize themselves with this feature, the following allocation limitation will apply to ensure that it is used for its intended purpose and not for price manipulation and gaming scenarios
 - The difference in offer prices between the two obligation periods for the same Capacity Auction Participant will be limited to ensure obligations are not unfairly acquired
 - The IESO proposes the following validation to take place during offer submission

$$0.4 \leq \frac{\text{Summer Offer Price}}{\text{Summer Offer Price} + \text{Winter Offer Price}} \leq 0.6$$

- This allocation spread amount was determined using historical Demand Response Auction clearing prices and offer price data
- The IESO will continue to assess the need for and parameters behind this allocation limitation
- This limitation will only apply to contingent offer submissions on a per lamination basis

8.2 Auction Clearing and Price Setting

During this step, the IESO uses an optimization model that maximizes the overall social welfare to determine which auction offers are accepted (or “cleared”) and the associated clearing price (or “prices paid”).

Approach in the June 2020 Capacity Auction

The IESO changed the price setting mechanism (which was reused from the former Demand Response Auction). The Ontario-Wide Auction Clearing Price will be set at the price where the last cleared offer quantity (in MW) vertically intersects the demand curve, to better represent the true cost of acquiring additional capacity. There was no change to the price setting mechanism for the zonal prices.

Approach in the March 2021 Capacity Auction

Decision

As explained in Section 8.1, the auction engine will now be able to process multiple and contingent offers.

The IESO will utilize the feature of zonal minimum limits. Zones with binding minimum limits could have higher clearing prices, compared to an un-constrained zone.

In addition to individual zonal limits, the IESO will also utilize minimum and maximum constraints for a group of zones (group zones -see [section 7.1](#) for details)

Capacity obligations generated from Contingent Offers will be paid at least their offered revenue, regardless of the zonal clearing price. This criterion is for the rare scenario where the capacity availability payments based on the zonal clearing prices might be less than the total annual revenue requirement offered by the CAP as represented by their offers in \$/MW-day. In this case, the CAP will be paid based on its weighted average offer prices rather than the zonal clearing price of the zone to which the CAP belongs, allowing the participants to recover its offered annual revenue requirement. With the aim to be as transparent as possible, the IESO will publish the price for every capacity obligation.

With the introduction of zonal minimum limits, prices in zones where that limit binds will be equal to or greater than system price, to ensure sufficient supply and signal for competition.

Zonal groups are a collection of two or more zones (e.g., two zones behind a single interface) which have their own limits in addition to individual zonal limits. Pricing for a zonal group where there is a constraint

binding would be similar to the pricing methodology of a single zone with binding constraints. For example, a zonal group with maximum limit binding might lead to lower prices for the zones within. A zonal group with a binding minimum constraint might lead to higher prices for the zones within.

8.3 Post-Auction Reporting Obligations

Post-auction reporting refers to the information published by the IESO to inform the market of the results of a capacity auction.

Approach in the June 2020 Capacity Auction

Following the execution of a Capacity Auction, the IESO prepares public and confidential post-auction reports to communicate the results. The IESO publishes the post-auction reports within four business days following the day on which the submission window closes. Both reports are reissued each time Capacity Obligations are modified as a result of a buy-out or Capacity Obligation transfer.

Public Post-Auction Reports

The public post-auction reports contain the following information for each Obligation Period and are posted on the IESO's reports site:

- The auction clearing price in each zone,
- The names of successful CAPs, and their Capacity Obligations by Capacity Auction Resource,
- The qualified capacity and type (whether virtual demand response, physical demand response or generation) of each Capacity Auction Resource in each zone, and
- The surplus capacity (or uncleared capacity) of each Capacity Auction Resource by zone.

To facilitate obligation transfers, the report separately lists surplus capacity by type.

Confidential Post-Auction Reports

The confidential post-auction reports are issued to individual CAPs and contained the following information for each Obligation Period, and are posted on the IESO's confidential reports site:

- The Capacity Obligation secured for each Capacity Auction Resource, and,
- The corresponding participation type (physical demand response, virtual demand response or Capacity Generation Resource).

Approach in the March 2021 Capacity Auction

Decision

March 2021 post-auction reports will be updated to provide information regarding contingent offers. For example, information to the CAP in the public and private report identifying which obligations were accepted on a contingent basis. Due to capacity obligation transfers and contingent obligations, prices within the same zone might be different for certain obligations. In continuing to provide market transparency, the post-auction public report will contain the price information for all obligations.

8.4 Anticipated Document and Tool Impacts

Impacted Market Rules

Market Rules	Description of Change
Chapter 7, Section 18	Amend section 18.6 to incorporate provisions related to multiple offers and contingent offers

Impacted Market Manuals

Market Manual	Description of Change
Market Manual 12	Update Section 4 Auction Mechanics to explain offer submission options, auction clearing and contingent offers

Other Impacts

Other Impact (IT Tool, Reporting, etc.)	Description of Change
Post-Auction Report (private)	Provide additional information regarding the obligation. For example, if the obligation was acquired through a contingent basis.
Post – Auction Report (public)	Similar to above private report. In addition, prices for each obligation to maintain transparency. Other small changes to better display Ontario-wide and zonal prices.
Auction Engine	Introduction of the feature to allow the auction engine to optimize multiple and contingent offers. In addition, the ability to utilize zonal minimum requirements and zonal groupings.
Online IESO	Update action 'Submit Capacity Auction Offer' to allow participants to identify contingent offers and to choose to submit multiple offers

9. Forward Period

This chapter provides details regarding activities conducted during the Forward Period of the Capacity Auction (see Figure 8).

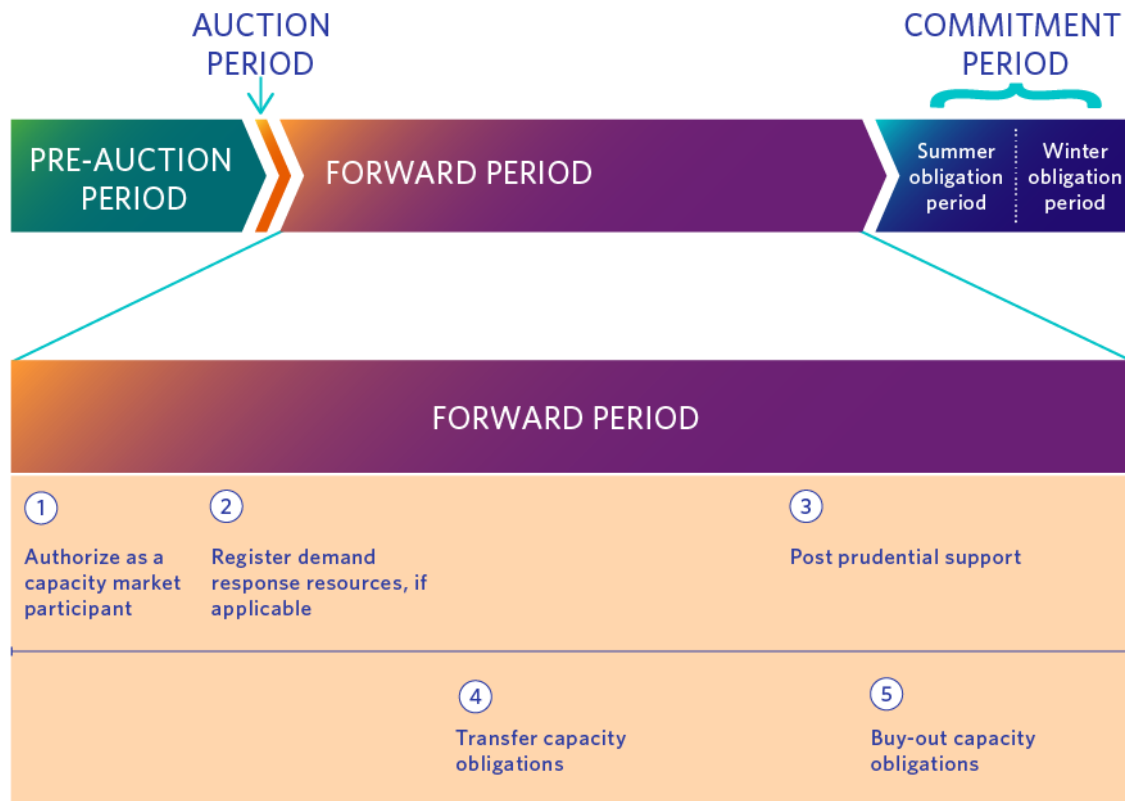


Figure 8 | Forward Period Activities

9.1 Participant Authorization

Approach in the June 2020 Capacity Auction

All Capacity Auction Participants (CAPs) that are successful in the auction are required to be authorized as Capacity Market Participants and take on all of the obligations under the Market Rules applicable to Capacity Market Participants. This authorization is completed only once and is valid for all future capacity auctions.

During each Forward Period, CAPs are required to complete a review of their prudential support.

Approach in the March 2021 Capacity Auction

Decision

There are no changes to the authorization of CAPs in the March 2021 Capacity Auction.

9.2 Registration of Demand Response Resources into the Energy Market

Approach in the June 2020 Capacity Auction

For Demand Response Resources, an energy market resource may not exist at the time of capacity enrollment. In these cases, the Capacity Market Participant must register a new resource in the energy market to satisfy its Capacity Obligation in the same manner as the previous auctions, so long as the attributes are the same as those provided during capacity enrollment (e.g. same zone, same type).

Capacity Market Participants that are seeking to change attributes of their resources in Online IESO (the IESO's registration system) in order 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 example, a resource may need to change its Bid/Offer type.

Approach in the March 2021 Capacity Auction

Decision

The IESO is continuing to work with demand response resources to refine their registration process. This activity will continue through the 2020 Demand Response Working Group, with the intention to implement changes in advance of the March 2020 Capacity Auction.

9.3 Capacity Prudential Support

Approach in the June 2020 Capacity Auction

All Capacity Market Participants with a Capacity Obligation are required to post prudential support for the Obligation Period, at least 60 days prior to its commencement.

The IESO calculates the capacity prudential support obligation as follows:

$$[Monthly Availability Payment (\$) \times 50\%] - Allowable Reductions$$

Where:

$$\text{Monthly Availability Payment} = \Sigma (\text{Capacity Obligations(MW) for the Obligation Period} \times \text{Zonal Clearing Price} \times 23 \text{ days}).$$

The capacity prudential support posted by a market participant/Capacity Market Participant to satisfy this obligation must be in the form of a guarantee or irrevocable commercial letter of credit, which in both cases must be in a form acceptable to the IESO and provided by a:

Bank named in a Schedule to the Bank Act, S.C. 1991, c.46 with a minimum Standard and Poor's long-term credit rating of "A" or equivalent from an IESO acceptable major bond rating agency; or

Credit union licensed by the Financial Services Commission of Ontario with a minimum Standard and Poor's long-term credit rating of "A" or equivalent from an IESO acceptable major bond rating agency.

Approach in the March 2021 Capacity Auction

Decision

There are no changes for Capacity Prudential Support in the March 2021 Capacity Auction.

9.4 Capacity Obligation Transfers

Approach in the June 2020 Capacity Auction

An organization with a Capacity Obligation may transfer their respective Capacity Obligations. A capacity transferor may request a full or partial Capacity Obligation transfer prior to the start of the Obligation Period (i.e., during the Forward Period only). The Capacity Obligation transfer will be valid for all or the remainder of the Obligation Period (if requested during the forward period but approved after the start of an Obligation Period) the Obligation Period subject to IESO approval.

In order to initiate a Capacity Obligation transfer, a written request must be submitted to the IESO by the capacity transferor prior to the last date to register/update contributor management for virtual resources. The IESO assesses the Capacity Obligation transfer request that meets the following criteria to determine whether to approve a transfer request:

- **Capacity Enrollment Criterion** – CAPs that registered multiple virtual hourly Demand Response Resources in a given zone (i.e., that registered a separate resource for C&I and for Residential) during the pre-auction period may transfer Capacity Obligations across these two resources. The sum of the auction capacity committed to these two resources cannot exceed the

sum of the enrolled capacity in pre-auction for these two resources. For example, if an organization enrolled 100 MW in the East zone as Virtual HDR – C&I and received an obligation for this entire amount, they can transfer the entirety of this capacity to Virtual HDR – Residential during the Forward Period, so long as (1) the auction capacity committed to the Virtual HDR – Residential does not exceed the total amount of enrolled virtual HDR auction capacity for that organization in the East zone and (2) the organization enrolled a Capacity Auction Resource with the type Virtual HDR – Residential with for at least 1 MW during the capacity enrollment process.

- **Consent Criterion** - No consent will be required for Capacity Obligation transfers between Capacity Obligations owned by the same organization however is required when transfers are between different organizations;
- **Increment Size Criterion** - The quantity to be transferred will continue to be in increments of 0.1MW, and the resulting Capacity Obligations for both the Capacity Transferor and Capacity Transferee following the transfer shall be 0 MW, or greater than or equal to 1 MW.
- **Inter-zonal Transfer Restrictions Criterion:** Inter-zonal transfers will be allowed. If the transfer is from a constrained zone to an unconstrained zone, the Capacity Transferee will be settled (i.e. receive an availability payment) based on the original obligation. For example, if the Capacity Transferor has an obligation where the zonal auction clearing price is \$10/MW-day, the Capacity Transferee could accept the transfer and its new obligation would be settled at \$10/MW-day, even if the receiving clearing price in its zone was higher. The zonal constraint sub-criterion would remain the same – therefore, the quantity to be transferred must not result in either the sending zone or the receiving zone violating a Capacity Auction zonal constraint. If there is a Capacity Obligation transfer into a previously constrained zone (i.e. a zone that was constrained but is no longer constrained as a result of a Capacity Obligation transfer or buy-out from that zone) from an unconstrained zone, the price that will be used to settle the new obligation will be the price from the original obligation – i.e. the originally unconstrained zone's price.
- **Like for Like Criterion:** The like for like requirement will apply only to the Obligation Type (whether physical or virtual). As a result, transfers between physical Demand Response Resources and Capacity Generation Resources will be permitted. Virtual Demand Response Resources will only be able to transfer to other virtual Demand Response Resources. This will be subject to the criterion that the quantity to be transferred must not result in the receiving zone reaching a Capacity Auction zonal constraint.
- **Resource Type Restrictions Criterion:** In order to enable imports, additional constraints will be added to the auction clearing mechanism that restricts the total capacity from imports. An

obligation transfer will be permitted as long as it does not result in a violation of this constraint and any locational constraints, such as the interface limit or zonal constraints.

In the event that multiple obligation transfers are requested simultaneously, the IESO will approve each transfer one-by-one by order of time stamp when the request was received by the IESO, until any limit is met or the requests have been successfully executed.

If a Capacity Auction Resource receives its Capacity Obligation as a result of one or more Capacity Obligation transfers and/or from clearing the auction, it will be settled using a 'blended' Capacity Auction Clearing Price.

The IESO will notify the Capacity Transferee of any additional deposit or prudential support obligation, if required.

Approach in the March 2021 Capacity Auction

Decision

With the introduction of contingent offers, obligations achieved by such offers will be treated as linked across obligations periods. Transfers for such type of obligation will not be allowed because it may provide an opportunity for gaming and over-complicated the transfer process.

Capacity Auction Participants and Capacity Market Participants who transfer obligations out of a zone will be unable to accept obligation transfers back into that zone in the same obligation period.

The obligation transfer process will be improved and will be performed through the OnlineIESO interface instead of by email request.

Obligation transfers back into a zone in which the CAP has once transferred out of, in the same obligation period, will not be allowed due to concerns of blended prices leading to unfairly decreased buyout charges. Once a CAP decides to transfer their obligation, in part or in full, out of a zone, it is deemed that they do not have the intention to transfer back into the zone.

Refer to the following chart for clarification around transfers between uncongested and congested zones due to zonal maximum limits, and binding and non-binding zones with zonal minimum requirements.

Table 1 | Capacity Obligation Transfer Scenarios

Category	Scenario	Permissible?	Comments
Transfers			
Max Limit	Transfers from a zone that has a binding maximum limit and lower price than the overall system-wide clearing price.	Allowed	Lower obligation price from the original congested zone will remain even after the transfer.
	Transfers from a zone that has a maximum limit, but it was not binding during the auction.	Allowed	Usual rules apply.
	Transfers to a zone that has a binding maximum limit and lower price than the overall system-wide clearing price.	Not allowed	
	Transfers to a congested zone with a lower price, where room was freed up from another transfer out or buyout.	Allowed	Obligation will have the original price from the "from" zone.
Min Limit	Transfers from a zone that has a binding minimum requirement and higher price than the overall system-wide clearing price.	Not allowed	
	Transfers from a zone that has a minimum requirement, but it was not binding during the auction.	Allowed only if...	Only allowed if the "from" zone does not drop below the minimum requirement as a result of the transfer.

Category	Scenario	Permissible?	Comments
	Transfers to a zone that has a binding minimum requirement and higher price than the overall system-wide clearing price.	Allowed	The obligation being transfer will keep its original price and not get the higher price in that zone.
	Transfers to a zone that has a minimum requirement, but it was not binding during the auction.	Allowed	Usual rules apply.

9.5 Buy-Outs

Approach in the June 2020 Capacity Auction

In the June 2020 Capacity Auction, the effective date of buy-out requests was restricted. When an organization requests a buy-out, the effective date of the buy-out is no earlier than 2 business days following when a request to buy-out is received by the IESO

An organization with a Capacity Obligation has the option to buy-out its Capacity Obligation at any time during the Forward Period or the Obligation Period. The organization could initiate a buy-out by submitting a written request to the IESO identifying the following information with respect to the buy-out request:

- Capacity obligation ID,
- Obligation Period (i.e., season),
- Electrical zone,
- Effective date, and
- Amount of capacity.

The IESO processes buy-out requests within 7 business days. At the end of this review period, the IESO either approves or rejects the buy-out request.

For a full buy-out request during the Forward Period, the pre-auction deposit is refunded upon request, if applicable, and the prudential support reduced to zero after receipt of the buy-out payment. For a partial buy-out request, the prudential support obligation is revised to reflect the new obligation after receipt of the buy-out charge.

A buy-out charge is applied using the physical markets settlement process for the next available month-end preliminary settlement statement. The buy-out is valid from the buy-out effective date until the end of the associated Obligation Period.

For each buy-out request, the Buy-Out Charge is calculated as follows:

$$\text{Buy - Out Charge} = 50\% \times \sum_d^n \text{CBOC}_k \times \text{CACP} \times (1 - \text{CNPF}_m)$$

Where:

'd' is a business day

'n' is the range of business days from the buy-out effective date to the end of the Obligation Period

'm' is the month that corresponds to the business day

'CBOC_k' is the buy-out capacity

'CACP' is the Capacity Auction Clearing Price

'CNPF_m' is the Non-Performance Factor for the applicable month

The buy-out charge is meant to provide partial compensation to the market when a CAP's or Capacity Market Participant (CMP) vacates their Capacity Obligation. Availability Payment reflecting the reduced Capacity Obligation amount is made to the Capacity Market Participant (CMP) from the effective date of the buyout. The 50% charge helps ensure good-faith participation in the Capacity Auction while allowing some flexibility/liquidity in lieu of rebalancing auctions. The charge also encourages Capacity Market Participants (CMP) to proactively inform the IESO if they are not able to meet their Capacity Obligations.

Approach in the March 2021 Capacity Auction

Decision

Capacity Obligations achieved from contingent offers will be treated as linked across Obligation Periods. The buyout from one period will mean the removal of an obligation from the other period. Any payments made in excess of the zonal clearing price for the obligation to satisfy its offer revenue will be clawed back depending on the buyout scenario. Buyouts from such obligations must be requested in full (i.e. the resultant obligation will be 0 MW).

Capacity Auction Participants and Capacity Market Participants who buyout their obligations from a zone will be unable to accept obligation transfers back into that zone in the same obligation period.

The obligation buyout process will also be improved and will be performed through the OnlineIESO interface instead of by email request. Similar to the restriction on obligation transfers, obligation transfers into a zone in which the CAP has once transferred out of, in the same obligation period, will not be allowed.

Refer to the following table in describing the different buyout scenarios.

Table 2 | Buy-Out Scenarios

Category	Scenario	Comments
Contingent obligations who received the Ontario-wide system clearing prices	Buyout before or during the summer obligation.	Winter contingent obligation will be bought out as well.
	Buyout during winter obligation period.	No impact from summer obligation as obligation was paid same as everyone else.
Contingent obligations with offer price as obligation price (summer offer price higher than zonal clearing price)	Buyout before or during the summer obligation.	Winter contingent obligation will be bought out as well. The difference in the obligation price and zonal clearing price in the summer will be recollected.
Contingent obligations with offer price as obligation price (winter offer price higher than zonal clearing price)	Buyout during winter obligation period.	The difference in the obligation price and zonal clearing price in the summer will be recollected. Difference in winter will be forgone.
	Buyout before or during the summer obligation.	Winter contingent obligation will be bought out as well. Difference in the zonal clearing price and obligation price will be forgone.
	Buyout during winter obligation period.	The difference in the obligation price and zonal clearing price in the winter will be recollected. Summer difference remains forgone.

9.6 Anticipated Document and Tool Impacts:

Impacted Market Rules

Market Rules	Description of Change
Chapter 7, Section 18	<ul style="list-style-type: none">Update section 18.9 to reflect the treatment of capacity obligation transfers resulting from contingent offers
Chapter 9, Section 4.7J	<ul style="list-style-type: none">Update section 4.7J.3 to reflect the treatment of a buy-out of a capacity obligation that was a result of a contingent offer

Impacted Market Manuals

Market Manual	Description of Change
Market Manual 12	<ul style="list-style-type: none">Update Section 7 Buyout Process to explain rules for buyouts of contingent obligations and process to request a buyout in Online IESO rather than emailUpdate Section 8 Capacity Obligation Transfers to explain rules for transfers of contingent obligations and process to request a transfer in Online IESO rather than emailRemove Appendix A

Other Impacts

Other Impact (IT Tool, Reporting, etc.)	Description of Change
Online IESO	<ul style="list-style-type: none">Create new actions in Online IESO to request a capacity obligation transfer or a buy out

10. Commitment Period

This chapter provides details regarding activities conducted during the Commitment Period of the Capacity Auction. Figure 9 illustrates the activities during the Obligation Periods.



Note: Some resources may have obligations for, and be compensated during, only one obligation period

Figure 9 | Commitment Period Activities

10.1 Energy Market Participation

Capacity Market Participants (CMP) are expected to satisfy their Capacity Obligations by participating in the energy market. Participation activities include:

- Demonstrating availability during the availability window. At minimum, the Capacity Auction Resources are required to submit dispatch data in the day-ahead commitment process and may

also be required to submit dispatch data in the real-time market, in a manner that respects the unique operating characteristics of that resource type,

- Submitting outage requests, if required, and
- Satisfying their Capacity Obligations by responding to dispatch instructions (and demonstrating their ability during test activations).

10.1.1 Capacity Availability Obligations

Approach in the June 2020 Capacity Auction

Capacity Generation Resources

Capacity Generation Resources with a Capacity Obligation are obligated to submit offers in the DACP through to real-time for the hours of the availability window. These offers are expected to be at least equal to their Capacity Obligation for each hour of the availability window during Pre-Dispatch (PD) from the first run of Pre-Dispatch (PD) until their PD-X where X will be the larger of: 1) Elapsed Time to Dispatch 2) Minimum Generation Block Down Time, and 3) 2-hour Mandatory Window.

Capacity Dispatchable Loads

Capacity Dispatchable Loads with a Capacity Obligation are obligated to submit bids in the DACP through to real-time for the hours of the availability window. These bids are expected to be at least equal to their Capacity Obligation.

HDR Resources

HDR Resources with a Capacity Obligation are obligated to submit and maintain bids at least equal to the allocated portion of their Capacity Obligation in the DACP for the hours of the availability window.

HDR resources may receive a standby notice day ahead or day-at-hand. If they do not receive a standby notice by 7:00 AM day at hand, HDRs are expected to remove their bids by 9:00am EST. If they receive a standby notice, they are expected to maintain their bids through to real-time.

Eligible energy bids for both Dispatchable Loads and HDR resources for the purpose of availability assessment should be greater than the bid price threshold of \$100/MWh and less than the Maximum Market Clearing Price (\$2000/MWh). The bid price threshold served to identify times at which bids reflected consumption patterns to follow incentives in the Industrial Conservation Initiative and ensure the resource was not dispatched for DR during this time.

System-Backed Capacity Imports

System-Backed Capacity Imports with a Capacity Obligation are obligated to submit offers in the DACP through to pre-dispatch for every hour of the availability window. These are expected to be at least equal to their Capacity Obligation.

Capacity Storage Resources

Capacity Storage Resources are obligated to submit offers for every hour of the availability window from DACP through to real time. These are expected to be at least equal to their Capacity Obligation up until the point where this resources receives a real-time dispatch, within the availability window, in the energy market. Following a real-time dispatch Capacity Storage Resources will no longer be obligated to maintain their offers for the balance of the day.

Approach in the March 2021 Capacity Auction

Decision

There are no changes to the dispatch data submission/availability requirements for resources that were enabled in the June 2020 Capacity Auction.

Additional availability requirements will be made to enable participation from Capacity Self-Scheduling Resources and Generator-Backed Capacity Imports to accommodate the unique operating characteristics of these resources.

Generator-Backed Capacity Resources will be required to maintain their import offers for every hour of the availability window from DACP through to real-time. Capacity Self-Scheduling Resources will be required to maintain their schedules for every hour of the availability window from DACP through to real-time.

The decisions on the approach to dispatch data submission for Generator-Backed Capacity Import Resources and Capacity Self-Scheduling Resources are described in detail in [Section 5.4](#) and [Section 3.2](#) respectively.

10.1.2 Resource Dispatch

Approach in the June 2020 Capacity Auction

Capacity Generation Resources

Capacity Generation Resources are committed, scheduled, and dispatched on a five-minute interval as per *Market Manual 4.3- Real Time Scheduling of the Physical Markets*.

Capacity Dispatchable Loads

Capacity Dispatchable Loads are committed, scheduled and dispatched on a five-minute interval as per *Market Manual 4.3- Real Time Scheduling of the Physical Markets*.

HDR Resources

HDR resources receive a “standby notification” in advance of a potential activation between 15:00 EST day ahead until 07:00 EST on the dispatch day, based on standby triggers as outlined in xxx. If a standby report is issued, HDR resources continue to submit bids for the dispatch day consistent with their Capacity Obligation. HDR resources are to be notified prior to an activation by receiving an Activation Notice approximately 2.5 hours before the start of the first dispatch hour for which it was activated. HDR resources can be activated once per day for up to four consecutive hours starting on the first day of the Obligation Period.

System-Backed Capacity Imports

System-Backed Capacity Imports are committed, scheduled and dispatched on an hourly interval as per *Market Manual 4.3- Real Time Scheduling of the Physical Markets*.

Capacity Storage Resources

Capacity Storage Resources are committed, scheduled, and dispatched on a five-minute interval as per *Market Manual 4.3- Real Time Scheduling of the Physical Markets*.

Approach in the March 2021 Capacity Auction

Decision

For the March 2021 Capacity Auction, the decisions on the approach to resource dispatch for Generator-Backed Capacity Import Resources and Self-Scheduling generation facilities will be consistent with the procedures outlined in *Market Manual 4.3 - Real Time Scheduling of the Physical Markets* with the exception of when a “capacity call” is made.

Self-Scheduling Generation Facilities do not receive a dispatch instruction, but are required to submit dispatch data in accordance with *Market Manual 4.2 Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets*.

Generator-Backed Capacity Imports may receive a “capacity call” requesting that the Generator-Backed Import become scheduled for at least the requested quantity in a specific hour(s). When a capacity call is made, the Capacity Market Participant with the Generator Backed Capacity obligation must ensure the import transaction becomes successfully scheduled as per *Market Manual 4.3 - Real Time Scheduling of the Physical Markets*, and ensure the backing generator is online and generating at a quantity consistent with the call parameters.

10.1.3 Outage Management/Non-Performance Events

Approach in the June 2020 Capacity Auction

Capacity Market Participants (CMP) are required to update their bids or offers, as applicable, to reflect their actual capability regardless of the nature of the outage (planned or forced). For outage submission, physical resources continue to submit outage requests as per the existing outage management process set out in the Market Manual 7.3: Outage Management. Capacity Market Participants may request for an adjustment to non-performance charges, for allowable scenarios, using the notice of disagreement (NOD) process.

Hourly demand response resources are not required to email the IESO of a non-performance event. Instead, they must provide records of non-performance event, upon request, to the IESO. As such, the virtual Capacity Market Participants need to retain details (event description, resource name, trade date, hours of reduced capacity, registered maximum and reduced capacity, capacity during non-performance event, and action taken to manage energy bids) for a period of 1 year from the end of the Commitment Period (even if they only received a summer obligation).

All energy market resources on planned or forced outage must, in addition to submitting outage requests, update offers in the energy market to reflect their unavailability to provide capacity during the availability

window. This is consistent with the treatment of DR resources. Since bids and offers are used to determine availability, Capacity Market Participants with reduced capacity may receive availability charges for failing to provide the difference between cleared Capacity Obligation and available reduced capacity in the energy market.

Capacity Auction Resources may make a request for an adjustment to non-performance charges using the notice of disagreement (NOD) process.

Approach in the March 2021 Capacity Auction

Decision 1

Generator Backed Capacity Imports, in the event the backing generator is on outage, the import offers will need to be removed to reflect the absence of the backing MWs.

Decision 2

Hourly demand response resources will be required to submit outages to the IESO in the same manner as other energy resources, as described in Market Manual 7.3. These outage submissions will replace requirements for non-performance events.

10.1.4 Test Activations

Approach in the June 2020 Capacity Auction

During a test activation, Capacity Auction Resources (other than System-Backed Capacity imports) with Capacity Obligations are required to demonstrate an injection of energy or a reduction of energy withdrawal at the point of connection with the IESO-controlled grid that is at least equal to the Capacity Obligation of the resource during the availability window.

Capacity Imports are required to be successfully scheduled in real-time if scheduled in PD-1 at an amount at least equal to the Capacity Obligation of the resource during the availability window.

All Capacity Market Participant resources may be test activated up to two times per Obligation Period.

Approach in the March 2021 Capacity Auction

Decision

For the March 2021 Capacity Auction, the decisions on the approach to scheduling of test activations for Generator-Backed Capacity Import Resources and Capacity Self-Scheduling Resources are described in detail in [Section 5.4](#) and [Section 3.2](#) respectively.

Capacity Obligations acquired in the March 2021 Capacity Auction may be discharged not only by offering capacity equal to the Capacity Obligation amount, but also by offering additional energy to the market. As a result, test activations now must confirm both that the resource is capable of delivering both the Capacity Obligation and any amount greater than the Capacity Obligation offered into the energy market.

If a resource has demonstrated, through dispatch in that Obligation Period that it can satisfy its Capacity Obligation, then the IESO may decide not to test it.

All resources will be tested against their Capacity Obligations for a duration of up to four hours. The notice for each resource will depend on the way they participate in the energy market as shown in Table 2 and the IESO will seek to find hours in which offers are at least equal to the Capacity Obligation.

Table 3 | Summary of Test Activation Protocols

	Dispatchable Load	HDR Resource	Capacity Generation Resource	Capacity Storage Resource	System-Backed Capacity Resource	Generator-Backed Capacity Resource	Capacity Self-Scheduling Resource
Duration of Test	Up to 4 hours	4 hour, unless qualified for reduced test duration	Up to 4 hours (may be constrained on longer due to Minimum Generation Block Run Time)	Up to 4 hours	Up to 4 hours	Up to 4 hours	Up to 4 hours
Testing Method	Constraint applied to the resource(s)	Standby and Activation Notice provided	Constraint applied to the resource(s)	Constraint applied to the resource(s)	Participant must ensure their import is economic in the energy market	Participant must ensure their import is economic in the energy market	Participant must submit appropriate schedule to the energy market
Amount Scheduled in the Real-Time Energy Market	Bid in the energy market	Bid in the energy market	Offer in the energy market	Offer in the energy market	Offer in the energy market	Offer in the energy market	Scheduled amount
Notice	Up to 1 hour	1 day	Quick start: Up to 1 hour Non-quick start: 1 day	Up to 1 hour	2 hours	Quick start: Up to 1 hour Non-quick start: 1 day	Up to 1 hour

	Dispatchable Load	HDR Resource	Capacity Generation Resource	Capacity Storage Resource	System-Backed Capacity Resource	Generator-Backed Capacity Resource	Capacity Self-Scheduling Resource
Assessment 1: If the bid/offer/schedule is equal to or greater than the Capacity Obligation	The participant will be expected to deliver the bid, offered, or scheduled amount (capped at 115% of capacity obligation) in order to be deemed a pass for the test activation.						
Assessment 2: If the bid/offer/schedule is less than the Capacity Obligation	<p>In order to be deemed a pass for the test activation, the following requirements must be satisfied:</p> <ol style="list-style-type: none"> 1. Have an outage submitted to the IESO of atleast the amount equal to the delta between the bid, offered, or scheduled and their capacity obligation; AND 2. Successfully delivered on the bid, offered, or scheduled amount 						
Associated Charge	Failure to satisfy the assessment will result in a Capacity Charge						
Other considerations		A separate assessment will be used to determine whether resource qualifies for reduced testing duration					

10.2 Payments

Capacity Market Participants are settled using the physical markets settlement process for both payments and non-performance charges. Non-performance charges resulting from a failure to satisfy Capacity Obligations are intended to incent compliance, ensure integrity of the electricity market, and to avoid the IESO paying for the capacity that has not been provided. Payment and charges described in this section are assessed and calculated for each Capacity Obligation.

10.2.1 Availability Payment

Approach in the June 2020 Capacity Auction

Capacity Market Participants signal availability to the IESO by submitting energy bids and offers to provide capacity. Participants are paid an Availability Payment for each month they have a Capacity Obligation.

Each payment is paid based on the Capacity Obligation, Capacity Auction Clearing Price (normalized hourly), hours of availability and number of business days within a month, regardless of the resource type. The availability payment for the month is calculated using the Availability Payment equation for each obligation as follows:

$$\text{Capacity Obligation} - \text{Availability Payment} = \sum_{h=1}^n CCO_k \times CACP_h$$

Where:

“h” represents an hour within the Hours of Availability for the month;

“n” is equal to the number of Hours of Availability for the month times;

“CCO” is the Capacity Obligation amount associated with a capacity obligation for the Obligation Period for Capacity Market Participant ‘k’. The initial Capacity Obligation is acquired through a Capacity Auction and subject to being reduced via the buy-out process; and

“CACP_h” is the hourly Capacity Auction Clearing Price for the Obligation Period and zone.

Approach in the March 2021 Capacity Auction

Decision

There will be no changes to the Availability Payment for the IESO March 2021 Capacity Auction other than the fact that Capacity Self-Scheduling Resources will be submitting schedules rather than offers or bids.

10.2.2 Seasonal Availability Charge True-Up

Approach in the June 2020 Capacity Auction

In the June 2020 Capacity Auction, all capacity auction resources are generally expected to be available for every hour of the availability window. Failure to be available results in an availability charge.

Approach in the March 2021 Capacity Auction

Decision

The IESO will be adding a new payment called the "Availability Charge True-Up". All Capacity Auction Resources are eligible to receive this payment. This true-up will allow an adjustment of the Availability Charge across the entire Obligation Period. At the end of each Obligation Period, the Availability Charge True-Up will pay each Capacity Auction Resource for making more capacity availability during the Availability Window in excess of its Capacity Obligation. It can reduce the total Availability Charges, at most, down to zero.

The Availability Charge True-up credit will true-up a Capacity Auction Resource's hourly availability charges incurred over the Obligation Period, based on its performance across the season.

The Availability Charge assessment only applies charges related to under-availability, and does not recognize the benefit of some over-availability to the system. Therefore, there is no opportunity for a resource to get a payment for over-availability, to average out its charges. The Availability Charge True-up calculated for each hour will be capped at 15% above their capacity obligation - that is to say, a resource will be paid for no more than 15% for its over-availability.

Total hourly availability charges over the season:

$$\text{Hourly Availability Charge} = \sum_m \sum_h \text{Max}(0, \text{CCO} - \text{CAEO}_{m,h}) \times \text{CACP}_h \times \text{CNPF}_m$$

Where:

"h" represents an hour within the Hours of Availability for the business day,

"n" represents a business day within the month

"m" represents a month in the Obligation Period.

"CCO is the hourly Capacity Obligation secured through a Capacity Auction,

"CAEO_{m,h}" is the offered quantity derived as the sum of:

- a) quantities from the price-quantity pairs of the energy offers/energy bids; or
- b) submitted self-schedules

associated with the capacity auction resource for hour “h” in each month “m” (min determined from day ahead and all pre-dispatch checks)

“CACP_h” is the hourly equivalent of the Auction Clearing Price (\$/MW-h), and

“CNPF_m” is the Capacity Non-Performance Factor for the month.

For the Availability Charge True-up, the availability charges can be reduced, (down to zero), by recognizing and crediting hours where the offered quantity exceeded the Capacity Obligation:

Hourly Availability Charge adjustment

$$= \sum_m \sum_n \sum_h \text{Max}(0, \text{Max}(CCO \times 0.15, CAEO_{m,h} - CCO)) \times CACP \times CNPF_m$$

Then

Availability Charge True Up (credit)

$$= \min (\text{Hourly Availability Charge}, \text{Hourly Availability Charge adjustment})$$

10.3 Performance Obligation Assessment and Associated Charges or True-Ups

10.3.1 Availability Charge

Approach in the June 2020 Capacity Auction

Availability charges apply when Capacity Market Participants fail to submit their capacity energy bids or energy offers, as applicable, for the day-ahead commitment process or in the real-time market for auction capacity up to their Capacity Obligation. As discussed in [Section 10.3.1](#), each resource type may have unique availability obligations and, therefore, are assessed for availability uniquely. Failure to meet these requirements would trigger a calculation of an availability charge. The charge is assessed on a monthly basis using the physical markets settlement process.

Approach in the March 2021 Capacity Auction

Decision

For the March 2021 Capacity Auction, there will be no change to the Availability Charge. The assessment methodology will continue to reflect the unique characteristics of each type of auction resource – in the case of new resources to the auction, Generator-Backed Capacity Import Resources and Capacity Self-Scheduling Resources, each will be subject to an assessment for when to apply the Availability Charge, as described in [Section 3.1](#) and [Section 3.2](#).

10.3.2 Capacity Charge

Approach in the June 2020 Capacity Auction

The capacity charge applies when a Capacity Auction Resource fails to perform a successful test activation. HDR resources are evaluated using a baseline that varies for residential and commercial & industrial contributors. The capacity charge, when applicable, is equivalent to one month's Availability Payment.

Approach in the March 2021 Capacity Auction

Decision

For the March 2021 Capacity Auction, the Capacity Charge will be revised to include the application of the monthly non-performance factor, applicable to the month where the test activation or failure to delivery capacity occurred.

The Capacity Charge will continue to apply to all Capacity Auction Resources for failure of a test activation, including Generator Backed Capacity Imports and Capacity Self-Scheduling Resources.

Testing is important to confirming that capacity is available if required, in particular for resources that are activated infrequently. To increase the incentive for resources to offer or bid their true energy capability into the energy market, and to recognize the increased value of capacity from month to month as is done for unavailability payments, the monthly non-performance factor will be applied to the capacity charge.

10.3.3 Administration and Dispatch Charges

Approach in the June 2020 Capacity Auction

The administration and dispatch charges are unique charges that are applicable only to HDR resources. The administration charge applies only to resources and/or contributors that are not revenue-metered by the IESO. The dispatch charge applies only to resources that are non-dispatchable with Commercial & Industrial contributors.

Approach in the March 2021 Capacity Auction

Decision

The Dispatch Charge will be removed for all Capacity Market Participants in the March 2021 Auction.

The Administrative Charge will now apply to all Capacity Market Participants who are required to provide measurement data to the IESO. This applies to all generator-backed capacity import resources and hourly demand response resources.

10.4 Cost Recovery

Approach in the June 2020 Capacity Auction

The costs to be recovered include payments (such as availability payments or out-of-market activation payments for HDR resources) net of any non-performance charges and buy-out charges per month. The cost recovery for the settlement of the Capacity Obligations are allocated to consumers in the form of a monthly uplift charge that uses the same allocation methodology used for the global adjustment. The IESO recovers costs using the following two uplift charges:

- 1350 "Capacity Based Recovery Amount for Class A Loads"
- 1351 "Capacity Based Recovery Amount for Class B Loads"

Class A load consumers are charged based on peak demand factors (calculated using their consumption at times of historical system peaks), while Class B load consumers are charged based on their monthly consumption. The monthly consumption is the same month in which the settlements occurred.

Approach in the March 2021 Capacity Auction

Decision

There are no changes to the cost recovery methodology in the IESO March 2021 Capacity Auction.

10.5 Anticipated Document and Tool Impacts

Impacted Market Rules

Market Rules	Description of Change
Chapter 9, Section 4.7J	<ul style="list-style-type: none">• Add new sections under section 4.7J.2.1 to enable the availability charge true-up• Delete section 4.7J.2.2 to remove the dispatch charge as it will no longer be applicable to any Capacity Market Participant

Impacted Market Manuals

Market Rules	Description of Change
Market Manual 12	<ul style="list-style-type: none">• Update testing protocol• Remove references to the dispatch charge
Market Manual 7.3	<ul style="list-style-type: none">• Replace non-performance event management for demand response resources with outage submissions
Market Manual 5.5 and Charge Types and Equations	<ul style="list-style-type: none">• Remove dispatch charge• Describe Seasonal Availability Charge True Up Payment

Other Impacts

Other Impacts (IT Tool, Reporting, etc.)	Description of Change
CROW	<ul style="list-style-type: none">• Allow hourly demand response resources to submit outages

List of Abbreviations

Abbreviation	Description
APO	Annual Planning Outlook
C&I	Commercial and Industrial
CAP	Capacity Auction Participant
CACE	Capacity Auction Control Entity
CAR	Capacity Auction Resource
CCO	Capacity Obligation
CMP	Capacity Market Participant
DACP	Day-Ahead Commitment Process
DL	Dispatchable Load
DR	Demand Response
EFOR _d	Equivalent Forced Outage Rate on Demand
GDP	Gross Domestic Product
HDR	Hourly Demand Response
IAM	IESO-Administered Markets
ICAP	Installed Capacity
IESO	Independent Electricity System Operator
MACP	Maximum Auction Clearing Price
MW	Megawatts
MWh	Megawatt-hours
NOD	Notice of Disagreement
OEB	Ontario Energy Board
OEFC	Ontario Electricity Financial Corporation
PD	Pre-Dispatch
UCAP	Unforced Capacity
QC	Qualified Capacity
RSI	Residual Supply Index

Glossary

The definitions listed in this glossary are intended to assist with comprehension of the design elements described in this document. These definitions do not necessarily reflect the terms set out in the IESO Market Rules, the final terms to be used in connection with the Capacity Auction, or the IESO's general interpretation of these terms as they may relate to other programs or aspects of the Market Rules.

Term	Definition
1-firm Pivotal Supplier Test	A structural test that assesses the potential for the exercise of unilateral market power by a Capacity Auction Control Entity (CACE) which controls Capacity Auction Resources (CARs). The 1-firm PST determines which, if any, CACE have the ability to economically withhold and must submit Capacity Auction Offers equal to or below the applicable default offer cap or resource specific offer cap.
Auction Period	With respect to a capacity auction, the length of time commencing with the opening of the window during which the IESO receives capacity auction offers, and finishing at the time at which the IESO publishes auction results;
Capacity Auction	An auction operated by the IESO to acquire auction capacity

Term	Definition
Capacity Auction Control Entity	<p>If a person or entity has the following types of control, they will be defined as a Capacity Auction Control Entity:</p> <ol style="list-style-type: none"> 1. A CAR that is owned by a corporation is controlled by a person if; <ol style="list-style-type: none"> i. securities of the corporation to which are attached more than 50% of the votes that may be cast to elect a majority of directors of the corporation are held, directly or indirectly, whether through one or more subsidiaries or otherwise, otherwise than by way of security only, by or for the benefit of that person, and ii. the votes attached to those securities are sufficient, if exercised, to elect a majority of the directors of the corporation that owns the CAR. 2. The CAR that is owned by a corporation is controlled by a government or other publicly owned entity if; <ol style="list-style-type: none"> iii. the corporation is controlled by the government or other publicly owned entity in the manner described in paragraph 1. i. or iv. in the case of a corporation without share capital, a majority of the directors of the corporation, other than ex officio directors, are appointed by <ol style="list-style-type: none"> A. the government or other publicly owned entity, as the case may be, or B. a duly authorized representative of the government or other publicly owned entity, as the case may be; 3. A CAR that is owned by an entity other than a corporation is controlled by a person if the person, directly or indirectly, whether through one or more subsidiaries or otherwise, holds an interest in the entity that entitles them to receive more than 50% of the profits of that entity or more than 50% of its assets on dissolution; 4. However, if: <ol style="list-style-type: none"> v. A person with whom a Capacity Auction Participant has any form of agreement under which such Capacity Auction Participant confers rights or the ability to determine the quantity or price of Capacity Auction Offers of a Capacity Auction Participant; such a person would be deemed to be the Capacity Auction Control Entity <p>If none of the above apply, then the Capacity Auction Participant is the Capacity Auction Control Entity.</p>
Capacity Auction Participant	A person who is a market participant that is authorized to participate in a Capacity Auction.
Capacity Auction Resource	A resource utilized by a Capacity Market Participant (CMP) to satisfy a capacity obligation

Term	Definition
Capacity Generation Resource	A capacity auction eligible generation resource with respect to which a Capacity Market Participant (CMP) has received a capacity obligation in a given capacity auction. This resource is both Non-committed and either Dispatchable or Self-Scheduling.
Capacity Market	The market administered by the IESO that uses an auction process to secure capacity, as described in this design document.
Capacity Market Participant	A person who is a Market Participant that has either a Demand Response Resource or a Capacity Generation Resource, Capacity Storage Resource, System Backed Capacity Resource with a Capacity Obligation and has authorized as such.
Capacity Obligation	The amount of auction capacity that a Capacity Market Participant (CMP) is required to provide using a specified capacity auction resource during each hour of the availability window of an Obligation Period
Commitment Period	The period of time for each capacity auction over which it secures capacity. It consists of two Obligation Periods
Capacity Storage Resource	A storage unit with a Capacity Obligation that is registered with the IESO as a dispatchable generation resource; whose owner is licensed with the OEB as energy storage; and is Non-committed.
Capacity Auction Clearing Price	The price at which the Capacity Auction clears for an Obligation Period and will be quoted in \$/MW-day.
Capacity Auction Deposit	The deposit required to be made by a capacity auction participant in accordance with section 18 of Chapter 7, as a condition of participating in a capacity auction
Capacity Auction Offer	An offer from a capacity auction participant, in the form of a price-quantity pair(s), to provide auction capacity from a specified capacity auction resource for an applicable Obligation Period, reflecting the amount of auction capacity that the capacity auction participant can reliably and responsibly provide if received as a capacity obligation, and which offer amount is no greater than the capacity auction participant's qualified capacity
Capacity Qualification Process	The capacity qualification process establishes the amount of capacity each individual resource can, on average, contribute towards meeting resource adequacy needs for the relevant Obligation Period.
Demand Response Capacity	The expected quantity of load reduction a demand resource can provide during a specified availability window and Commitment Period for a Demand Response Auction, and excludes energy transacted through the energy market.
Default Offer Cap	The maximum Capacity Auction Offer Price for any Capacity Auction Resource under the control of a Capacity Auction Control Entity that fails the market power mitigation test, expressed in \$/MW-day.

Term	Definition
Dispatchable Generation	A generation facility or unit registered with the IESO to which the IESO can direct real-time operation to cause a specified amount of electric energy or ancillary service to be provided to or taken off the electricity system at least 45 days prior to the start of the Obligation Period.
Dispatchable Load	A Load Facility which is subject to dispatch by the IESO and whose level is selected or set based on the price of energy in the real-time market, and excludes Hourly Demand Response resources.
Equivalent Forced Outage Rate on Demand (EFOR _d)	A measure of the probability that a capacity resource will not be available to operate due to a forced outage when there is demand on the capacity resource to generate.
Forward Period	The period of time immediately following a capacity auction, to the commencement of an Obligation Period;
Hourly Demand Response (HDR)	The resource type described in section 19 of Chapter 7, that is used by the IESO as a delivery type, on an hourly basis, for a DR Capacity Obligation.
Load Facility	A facility that draws electrical energy from the integrated power system.
Market Manual	A published document that is entitled as such and that describes procedures, standards and other requirements to be followed, met or performed by market participants, the IESO and other persons in fulfilling their respective obligations under the Market Rules.
Market Rules	Rules made under section 32 of the Electricity Act, 1998.
Mandatory Window	Time period starting from two (2) hours prior to the dispatch hour until 10 minutes prior to the start of the dispatch hour.
Minimum Generation Block Down Time	The minimum number of hours, specified by the market participant, required between the time a generation unit is last at its minimum loading point before de-synchronization and the time the generation unit reaches its minimum loading point again after synchronization.
Non-committed	Resources that are not –in whole or in part - rate-regulated, contracted to the IESO, contracted to the Ontario Electricity Financial Corporation, or obligated as a resource backed capacity export to another jurisdiction during the entire duration of a given Commitment Period.
Obligation Period	The length of time for which a Capacity Market Participant (CMP) is required to satisfy its Capacity Obligation by making its capacity available for dispatch in the Energy Market.
Obligation Type	Subtype that describes how a Capacity Obligation is modelled in the IESO system; can be either physical or virtual.

Term	Definition
Resource-Specific Offer Cap	A cap to the price of a Capacity Auction Offer that a Capacity Auction Participant can request if it does not believe that its Capacity Auction Resource can recover its costs of meeting the capacity obligation under the Default Offer Cap established by the IESO, expressed in \$/MW-day.
Residual Supply Index (RSI)	A ratio that is calculated for each Obligation Period as the total available qualified capacity less total available qualified capacity controlled by the Capacity Auction Control Entity being tested, divided by the total capacity to be acquired. The RSI is calculated in order to conduct the 1-firm Pivotal Supplier Test on both a zonal and system-wide level.
Small Fish Threshold	A threshold that is used to exempt Capacity Auction Control Entities from the market power mitigation test if the amount of MWs registered for participation in the Capacity Auction under the control of the Capacity Auction Control Entity is less than the threshold that is established by the IESO, expressed in MWs of installed capacity.
System-Backed Capacity Resource	Imported capacity that is attributed to, or considered to be supplied from, the entire system of a neighbouring jurisdiction.
Target Capacity	The amount of capacity the IESO will seek to clear in a Capacity Auction.
Zonal Maximum Capacity	The maximum capacity that can be acquired in a zone that is effective in satisfying or exceeding resource adequacy criteria.
Zonal Minimum Capacity Requirement	The minimum capacity that must be acquired in a zone in order to satisfy resource adequacy criteria.

Appendix A – Capacity Product Definition

The Capacity Product

The objective of the Capacity Auction is to secure capacity to meet Ontario's future resource adequacy needs at the lowest cost. At a very high level, the auction will secure capacity that can be summarized as follows:

The Capacity Auction aims to secure the availability of a given resource(s) for the energy market. This availability is defined as the capacity product and is quantified recognizing each resource's expected capacity contribution during times of resource adequacy needs; and the core obligation of this product will require a capacity auction resources to make, on average, the full amount of their cleared capacity available in both the day-ahead and real-time energy markets during a predefined set of hours.

Capacity vs. Energy

It is important to recognize the difference between two related concepts: capacity and energy. Capacity is the potential of a resource to produce electricity, or reduce consumption, at a given instant in time, measured in megawatts (MW). Energy is the amount of electricity a resource actually produces, or reduces consumption by over a specified period of time, measured in megawatt-hours (MWh).

The Capacity Auction is a market based mechanism to secure capacity only (that is, the capability of a resource to participate in the energy markets at times of resource adequacy needs), while the energy market aims to ensure sufficient energy is supplied at all times. In other words, the capacity product that the auction seeks to secure is the availability of a resource during a predefined set of hours. Furthermore, satisfying capacity needs also supports operational planning activities such as outage approval assessments for transmission and resource outages.

Relevant Capacity Auction Design Aspects

The following figure illustrates the auction key design aspects that are informed by the definition of the capacity product.

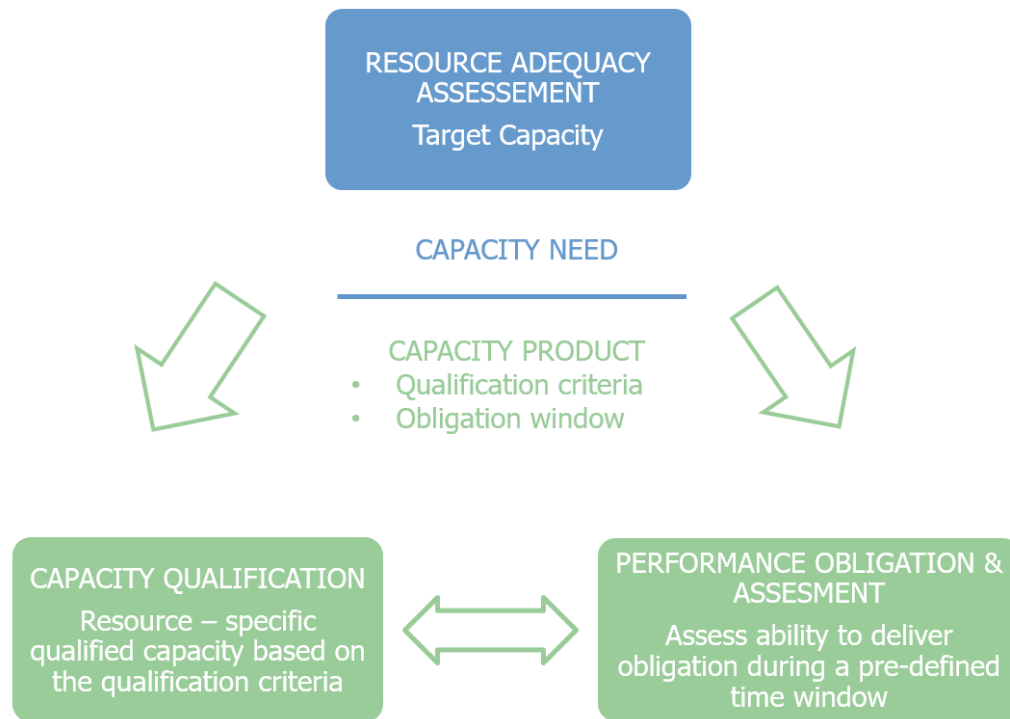


Figure 10 | Key design aspects informed by the capacity product

In the planning timeframe, the capacity need is determined through the resource adequacy assessment, which informs the target capacity to be secured through a given auction for each Obligation Period. The capacity need is determined by establishing the incremental amount of capacity that is forecasted to be required to meet Ontario’s resource adequacy needs during a single Obligation Period. This is in addition to the capacity contribution from existing contracted resources and rate-regulated facilities. Note that the target capacity in an auction could be based on the entire amount of identified capacity need, or some portion of it, depending on the outcomes of other potential procurement mechanisms.

In the pre-auction period, a capacity qualification process is used to determine the maximum amount of capacity a resource can offer into an auction. To ensure fairness and parity across all participants and resources, the IESO will standardize and complete an assessment of capacity qualification for all resources that qualify in a given capacity auction. This will be accomplished by analyzing a resource’s physical characteristics and technological limitations against the *qualification criteria*. The outcome of the capacity qualification process is the qualified capacity value in units of megawatts of Unforced Capacity (UCAP) determined for each resource.

In the commitment period, participants that successfully clear the auction will have to fulfil certain performance obligations in the energy market. Generally, resources with a capacity obligation are expected to, on average, make their cleared capacity available during the *availability window*. The IESO assesses whether participants have met their performance obligations, and if they fail to do so, financial consequences

(i.e., charges) apply, which are intended to incentivize compliance and prevent payments to Capacity Market Participants (CMP) that fail to satisfy their obligations.

Capacity Product Definition

The IESO approximates the capacity need into a defined capacity product. When Capacity Market Participants (CMP) satisfy their capacity obligations, the IESO has a very high degree of certainty that a resource was available to the energy market. The capacity product is defined through three key dimensions:

- 1. Hours of day:** The hours during each day that a resource is expected to be needed to satisfy resource adequacy
- 2. Days per season:** The days of the Obligation Period a resource is expected to be needed to satisfy resource adequacy
- 3. Duration:** The duration an energy-limited resource must be able to deliver its energy to provide the same contribution to resource adequacy

During the capacity qualification stage, the hours of day and days per season are used in combination to define a 'peak window'. This window is used to estimate the capacity contribution from certain types of resources. During the commitment period, the hours of day and days per season are used in combination to define the Availability Window.

For example, when qualifying Self-Scheduling Generation Facilities, their qualified capacity value will be based on their average output capability during this peak window. The capacity product definition will be used as the criteria for Capacity Qualification. These criteria will be applied depending on a resource's physical characteristics and technological limitations.

Capacity Product Parameter	Application for Capacity Qualification Criteria	Definition for Performance Obligations and Assessment	Example
Hours of Day	Summer: 12:00 to 21:00 EST (hour ending 13 to hour ending 21) Winter: 16:00 to 21:00 EST (hour ending 17 to hour ending 21)	Summer: 12:00 to 21:00 EST (hour ending 13 to hour ending 21) Winter: 16:00 to 21:00 EST (hour ending 17 to hour ending 21)	The hours of the day would be used for determining the hours of assessment for self-scheduling resources.
Days per season	Business days	Business days	The days would be used for determining the qualification window for self-scheduling resources.
Duration	4 hours	4 hours	The 4 hour duration is used to levelize the contribution of energy-limited resources with varying power and energy capabilities towards meeting resource adequacy needs.

Guided by the overall principles of the Capacity Auction, the IESO will focus on three principles when defining the parameters of the product:

- **Efficiency:** The capacity product should be defined to meet resource adequacy needs. The associated requirements and obligations should not be stricter than necessary;
- **Certainty:** The capacity product definition should be reasonably stable. The review cycle and process for updating the product definition should be clearly defined.
- **Transparency:** The capacity product should be specific and communicated to participants timely. Advance notice should be given for any change to the product definition.

Appendix B – Market Power Mitigation

Capacity Auction Control Entity

During the Capacity Qualification process, the CAP will be required to list all applicable entities that have Capacity Auction control over each CAR under its ownership, i.e., Capacity Auction Control Entities or CACEs. The CAP will be required to submit an attestation by a senior manager of all applicable to the CAR CACEs, including any exhibits, to support that the declaration is complete and accurate.

If a person or entity has the following types of control, they will be defined as a CACE:

5. A CAR that is owned by a corporation is controlled by a person if;
 - i. securities of the corporation to which are attached more than 50% of the votes that may be cast to elect a majority of directors of the corporation are held, directly or indirectly, whether through one or more subsidiaries or otherwise, otherwise than by way of security only, by or for the benefit of that person, and
 - ii. the votes attached to those securities are sufficient, if exercised, to elect a majority of the directors of the corporation that owns the CAR.
6. The CAR that is owned by a corporation is controlled by a government or other publicly owned entity if;
 - i. the corporation is controlled by the government or other publicly owned entity in the manner described in paragraph 1. i. or
 - ii. in the case of a corporation without share capital, a majority of the directors of the corporation, other than ex officio directors, are appointed by
 - A. the government or other publicly owned entity, as the case may be, or
 - B. a duly authorized representative of the government or other publicly owned entity, as the case may be;
7. A CAR that is owned by an entity other than a corporation is controlled by a person if the person, directly or indirectly, whether through one or more subsidiaries or otherwise, holds an interest in the entity that entitles them to receive more than 50% of the profits of that entity or more than 50% of its assets on dissolution;
8. However, if:
 - i. A person with whom a CAP has any form of agreement under which such CAP confers rights or the ability to determine the quantity or price of Capacity Auction Offers of a CAP; such a person would be deemed to be the CACE.
9. If none of the above apply, then CAP is the CACE.

The Figure 1 below presents a simplified example of the CACE, CAP and CARs relationship.

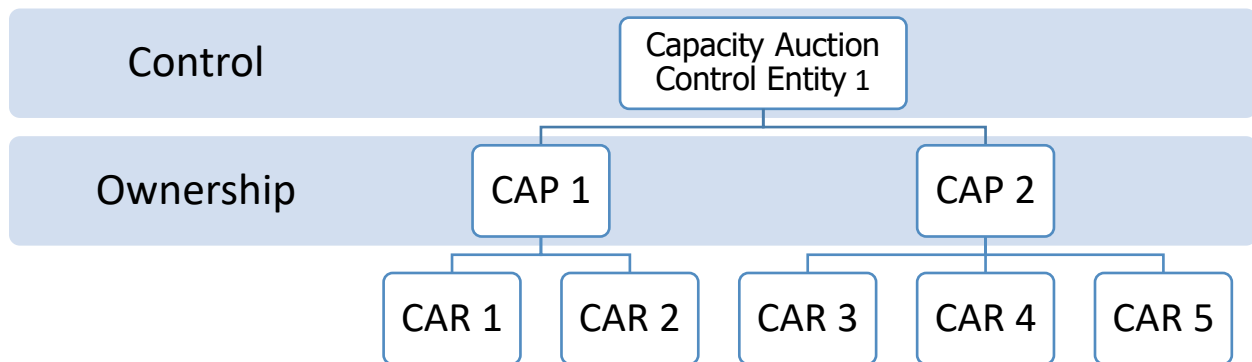


Figure 11 | Capacity Auction Control Entity – Example

Figure 11 presents a simplified example where one CACE controls the CARs (CARs 1-5) that are registered and owned by two separate the CAPs1 and 2. There may be other combinations of the ownership and control, e.g., the same CAP may own several CARs which are controlled by separate CACEs or there may be several CACEs in control of a single CAR.

As further discussed elsewhere in this document, the market power mitigation processes and outcomes will be based on the portfolio of the CACE, and not the CAP's total CARs registered in the Capacity Auction. For the cases where a CAR is controlled by more than oneCACE, the full capacity (MW) associated with that CAR will be accounted in calculating Small Fish Exemptions and 1-firm Pivotal Supplier Test for each of the capacity auction control entities that has control over that CAR.

The 1-firm Pivotal Supplier Test

Zonal 1-firm Pivotal Supplier Test

When the energy that can be transferred into the zone or a group of zones is less than the demand, a minimum amount of capacity within the zone or group of zones – Minimum Zonal Capacity Requirement - must be acquired through the Capacity Auction to satisfy resource adequacy.

Such zones or groups of zones will have a Minimum Zonal Capacity Requirement established prior to each auction. If there are no Minimum Zonal Capacity Requirements established for any single zone or group of zones for the auction summer or winter Obligation Period, the zonal 1-firm Pivotal Supplier Test will not be conducted for that Obligation Period. In that situation, the IESO will proceed with conducting System-wide 1-firm Pivotal Supplier Test only.

For clarity, the IESO will conduct zonal 1-firm Pivotal Supplier Test if Minimum Zonal Capacity Requirement is established for either both – a single zone and a group of zones – or for only a zone or only a group of zones.

The zonal 1-firm Pivotal Supplier Test will be conducted by calculating zonal CACE's Residual Supply Index (RSI) – Single-Zone and Zone-Group CACE's RSI - for each of the two Obligation Periods. The zonal 1-firm Pivotal Supplier Test will use total qualified capacity controlled by the CACE in the zone or group of zones where the test is being conducted.

The calculated Single-Zone and Zone-Group CACE's RSI is compared to Zonal RSI threshold of 1.

A Zonal RSI threshold of 1 indicates that 100% of zonal minimum capacity requirement needs to be covered by the excess qualified capacity in the zone or group of zones coming from CARs controlled by other CACEs than the CACE that is being tested. The IESO will monitor and evaluate the need to periodically change Zonal RSI threshold of 1 and the potential need to differentiate RSI threshold by zones and groups of zones based on its expectations of the supply and demand conditions for each auction.

The IESO will use the equations below to calculate Single-Zone and Zone-Group CACE's RSI for each CACE on the basis of all of its CARs registered by the CAP in that zone or group of zones. If Single-Zone and Zone-Group CACE's RSI ratios are greater than the corresponding Zonal RSI threshold, the CACE passed the Zonal 1-firm Pivotal Supplier Test.

Single – Zone Capacity Auction Control Entity's RSI

$$= \frac{\text{Total SingleZone QC} - \text{SingleZone Capacity Auction Control Entity's QC}}{\text{Minimum Zonal Capacity Requirement}_{\text{Single-Zone}}}$$

$$\text{Single – Zone Capacity Auction Control Entity's RSI} > \text{Zonal RSI Threshold}$$

Zone – Group Capacity Auction Control Entity's RSI

$$= \frac{\text{Total ZoneGroup QC} - \text{ZoneGroup Capacity Auction Control Entity's QC}}{\text{Minimum Zonal Capacity Requirement}_{\text{Multi-Zone}}}$$

$$\text{Zone – Group Capacity Auction Control Entity's RSI} > \text{Zonal RSI Threshold}$$

In theses equations:

- Total Single-Zone or Zone-Group QC is total qualified capacity (MW) that was qualified by the IESO for participation in the zone or group of zones that is being tested.
- Single-Zone or Zone-Group CACE's QC is total Qualified Capacity (MW) qualified by the IESO and controlled by the screened CACE in the zone or group of zones that is being tested. If there are Imports or New CARs under CACE's control, only Imports will be accounted for in the Single-Zone or Zone-Group CACE's Qualified Capacity for the purpose of Zonal 1-firm Pivotal Supplier Test. If the CACE is subject to mitigation in the result of the 1-firm Pivotal Supplier Test, Imports will be exempted from the mitigation (i.e., an offer cap).

- Minimum Zonal Capacity Requirement (Single-Zone or Zone-Group) is the minimum amount of Auction Capacity that a Capacity Auction must acquire for a specific zone or group of zones if sufficient Capacity Auction Offers have been provided.

System-wide 1-firm Pivotal Supplier Test

Independent of the outcome of the Zonal 1-firm Pivotal Supplier Test, the IESO will conduct a System-wide 1-firm Pivotal Supplier Test after zonal testing is completed.

The system-wide 1-firm Pivotal Supplier Test will use the total qualified capacity controlled by the CACE in the auction for which the test is being conducted. The system-wide 1-firm Pivotal Supplier Test will be conducted by calculating the System-wide CACE's RSI for each of the two Obligation Periods.

The calculated System-wide CACE's RSI is compared to System-wide RSI threshold of 1.

The IESO will use the equation below to calculate System-wide CACE's RSI. If System-wide CACE's RSI ratio is greater than the System-wide RSI threshold of 1, the participant is considered to pass the test. If the System-wide CACE's RSI is equal or less than 1, the test is considered failed as it implies that the market cannot meet total expected target demand without at least some of the capacity controlled by the CACE that is being screened.

System – wide Capacity Auction Control Entity's RSI

$$= \frac{\text{Total Qualified Capacity} - \text{Total Capacity Auction Control Entity's QC}}{\text{Target Capacity}}$$

$$\text{System – wide Capacity Auction Control Entity's RSI} > \text{System – wide RSI Threshold}$$

In this equation:

- the Total Qualified Capacity is total capacity that was qualified by the IESO for participation in the auction.
- Total CACE's QC is an amount of total Qualified Capacity qualified by the IESO that is controlled by the CACE that is being tested. If there are Imports or New CARs under CACE's control, only Imports will be accounted for in the Total CACE's Qualified Capacity for the purpose of System-wide 1-firm Pivotal Supplier Test. If the CACE is subject to mitigation in the result of the 1-firm Pivotal Supplier Test, Imports will be exempted from the mitigation (i.e., an offer cap).
- Target Capacity is the amount of capacity system-wide that the IESO will seek to commit for an Obligation Period.

Outcomes of the Zonal and System-wide 1-firm Pivotal Supplier Test

The assessment of the market power mitigation testing will be conducted separately for each CACE that is not exempted from this testing as per Section 6.1.

If the IESO conducted Zonal 1-firm Pivotal Supplier Test for both single zones and groups of zones, the IESO will conduct the interim assessment first on the basis of the Zonal 1-firm Pivotal Supplier Test results as outlined in Table 4 below. However, in order to conclude final market power mitigation outcomes, the IESO will be conducting the final assessment as outlined below in Table 4.

Table 4 | Zonal 1-firm Pivotal Supplier Test – Assessment of Interim Outcomes

		Zone-Group 1-firm Pivotal Supplier Test	
		Passed	Failed
Single-Zone 1-firm Pivotal Supplier Test	Passed	Zonal 1-firm PST passed.	Zonal 1-firm PST failed. Although the single-zone test was passed, CACEs' portfolios still contribute to the supply in the group of zones and can be used to affect the auction-clearing price.
	Failed	For CARs in the single zones where Zonal 1-firm Pivotal Supplier Test was failed, Zonal 1-firm PST will be deemed failed.	Zonal 1-firm PST failed.
		For all other zones in the group of electrical zones, Zonal 1-firm PST will be deemed passed.	

After the IESO completed the interim assessment or if the IESO conducted Zonal 1-firm Pivotal Supplier Test for either only a single zone or a zone group, the IESO will conduct the final assessment for each CACE on the basis of the Zonal 1-firm Pivotal Supplier Test and System-wide 1-firm Pivotal Supplier Test results as outlined in Table 5 below.

Table 5 | 1-firm Pivotal Supplier Test – Assessment of Final Outcomes

		System-wide 1-firm Pivotal Supplier Test	
		Passed	Failed
Zonal 1-firm Pivotal Supplier Test	Passed	The CAPs are notified that all of the auction offers for the CACE's CARs under their ownership are allowed to be submitted at a price up to the Maximum Auction Clearing Price.	The CAPs are notified that all of the auction offers for the CACEs' CARs under their ownership, with an exception of Import resources, are subject to an applicable offer cap. Although Zonal test was passed, CACE's portfolios still contribute to the system supply and can be used to affect the auction-clearing price.
	Failed	The CAPs are notified that: 1. For CARs in the zones where Zonal 1-firm Pivotal Supplier Test was failed, all of the auction offers for the CACE's CARs in such zones under CAP's ownership, with an exception of Import resources, are subject to an applicable offer cap. 2. For all other zones, the auction offers for the CACEs' CARs under CAP's ownership are allowed to be submitted at a price up to the Maximum Auction Clearing Price.	The CAPs are notified that all of the auction offers for the CACE's CARs under their ownership, with an exception of Import resources, are subject to an applicable offer cap.

If IESO did not conduct Zonal 1-firm Pivotal Supplier Test at all (neither for a single zone nor for a group of zones), the final market power mitigation results will be determined solely on the basis of the System-wide 1-firm Pivotal Supplier Test.

As stated previously, for the cases where a CAR is controlled by more than one CACE, the full qualified capacity (MW) associated with that CAR will be accounted in testing for mitigation for each of the CACEs that has control over that CAR. If any of the CACEs that has control over the CAR is mitigation under the 1-firm Pivotal Supplier Test, the IESO will mitigate such CAR (i.e., apply offer cap).

Example

CAR A with 200 MW of qualified capacity is controlled by CACE 1, 2, and 3. 1-Firm Pivotal Supplier Test will be assessed separately for each CACE, counting entire 200 MW of CAR's qualified capacity in each CACE's total capacity. In this example, if even one of three CACEs was to fail 1-firm Pivotal Supplier Test, the CAR would be subject to mitigation (i.e., to an applicable offer cap).

CACE 1	CACE 2	CACE 3	--->	CAR A = 200 MW
Failed	Passed	Passed		Mitigated

Default Offer Caps

Methodology

The IESO will set a single seasonally non-differentiated Default Offer Cap that will apply to both summer and winter obligation periods. Default Offer Cap will be set at a level below the Maximum Auction Clearing Price.

The Default Offer Cap will be based on the estimated competitive Capacity Auction outcome determined by the IESO on the basis of the applicable demand curve and the supply curve. The Default Offer Cap will be set for each Capacity Auction at a level which corresponds to a minimum of the competitive Capacity Auction Offer from a likely marginal resource in the two corresponding obligation periods.

When establishing the Default Offer Cap, the IESO will determine the estimated competitive Capacity Auction outcome on the basis of the analysis incorporating a set of assumptions and data, including estimated by the IESO demand curve and supply curve.

The proposed methodology ensures that all auction offers from resources that are able to exercise market power and have submitted Resource-Specific Offer Caps above the Default Offer Cap will undergo a review process. Therefore, setting the Default Offer Cap at a level which corresponds to a competitive auction offer from a likely marginal resource will prevent any non-competitive offer from setting the auction price.

This method is adopted not to provide an indicator of the likely clearing price in the next auction, but with the objective of setting the Default Offer Cap value at a level that would ensure that any non-competitive auction offer is not able to uncompetitively impact the clearing price.

The proposed approach is most similar to the methodology used in NYISO market. This approach was selected as it provides IESO with an ability to incorporate historic data as well as projected forward-looking assumptions in a relatively simple manner.

Default Offer Cap Value Calculation

When setting the Default Offer Cap, the IESO will determine the estimated competitive auction outcome on the basis of the analysis incorporating a set of assumptions and data, including:

- Projected by the IESO demand curve,

- Estimated by the IESO supply curve,
- The past auction clearing prices,
- Estimated prices at which resources will be willing to take on a capacity obligation (i.e., net avoidable costs),
- Estimated energy and ancillary service markets revenues based on the historical approach, which uses the past three years of realized energy revenues and variable costs (i.e., offers) as a proxy for net Energy and Ancillary Services revenues where available, supplemented with IESO and 3rd party estimates, and
- Any other assumptions in the IESO's knowledge and that the IESO may find relevant.

The Default Offer Cap will be set for each auction at a level which corresponds to a minimum of the competitive auction offer from a likely marginal resource in the two Obligation Periods. Selecting the minimum avoids the risk of under mitigation in one of the two Obligation Periods.

Conducting Ongoing Value Updates

The IESO will calculate the Default Offer Cap value before each Capacity Auction. The Default Offer Cap will be published prior to each auction as a part of the pre-auction report.

Resource Specific Offer Caps

Methodology

Resource-Specific Offer Caps for all resource types are calculated by summing up all the costs the resource would avoid if it did not have a Capacity Obligation, otherwise known as going-forward costs (GFC), and dividing by the QC rating of the resource multiplied by the number of business days in the Obligation Period.

Equation 1: Generic Resource-Specific Offer Cap Formula

$$\text{Resource – specific Offer Cap} = \frac{\text{Resource's Net Avoidable GFC}}{\text{Resource's QC} \times N}$$

Where:

Resource's Net Avoidable GFC are all the net avoidable going-forward cost (GFC) the resource would avoid if it did not have a Capacity Obligation. Avoidable costs are defined as any costs the resource would incur if it clears the auction and receives a Capacity Obligation but would not incur if it does not have a Capacity Obligation. GFC is equal to the expected costs to be incurred during each Obligation Period corresponding to the Capacity Auction, which are necessary for operating the resource to provide capacity. The avoidable GFC will be net of all expected net revenues to be made by the resource in the commitment period, not including revenues made

from capacity payments. The details of calculation of this component for each specific type of the Resource-Specific Offer Caps are provided below in this section, demonstrating that the numerator of the formula will differ for generation resources depending on what the CAR plans to do if it does not clear the Capacity Auction and for demand response resources depending on demand response type.

Resource's QC is qualified capacity of the resource calculated by the IESO. This value will differ for most of the resources for summer and winter Obligation Periods.

N denotes a number of business days in the Obligation Period, estimated as number of business days per Obligation Period less holidays (the exact number of business days in each Obligation Period will vary year by year).

Zonal Considerations

There will be no methodological differences by zone. The net avoidable GFC of resources would capture differences in avoidable costs by zone.

Seasonal Considerations

The equation 1 above will apply to calculation of the Resource-Specific Offer Caps for all three types of offer configurations possible under the IESO auction design: summer-only seasonal, winter-only seasonal, and contingent summer and winter. A resource that wishes to offer in all three configurations, would get four separate Resource-Specific Offer Caps, one for each of the following offers: summer-only, winter-only, summer contingent, and winter contingent.

The net avoidable GFC of a single resource may have up to three values, a summer-only value, a winter-only value, and an annual value. These three values can be different for the same resource, as the avoided costs of not having a Capacity Obligation may be different for summer relative to winter or the entire year. Equations 2-4 below illustrate the detailed version of the generic equation 1 that IESO will use for setting Resource-Specific Offer Caps for each of three offer configurations.

Given that the summer-only and winter-only offers are not contingent on having a Capacity Obligation in both seasons, the CAPs may submit seasonal-only offers that cover all the net avoidable GFC in the entire Commitment Period for their resources. Therefore, the Resource-Specific Offer Caps on the summer-only and winter-only offers (equations 2 and 3) can include all the costs that would be avoided in the entire Commitment Period in the numerator, divided by the number of MW-days the resource is offering into the Capacity Auction.

Equation 2: Resource-Specific Offer Cap Formula for Summer-Only Seasonal Offers

$$\text{Summer – Only Resource – Specific Offer Cap} = \frac{\text{Resource's Net Avoidable GFC}_{\text{Summer}}}{\text{Resource's QC}_{\text{Summer}} \times N_{\text{Summer}}}$$

Equation 3: Resource-Specific Offer Cap Formula for Winter-Only Seasonal Offers

$$\text{Winter – Only Resource – Specific Offer Cap} = \frac{\text{Resource's Net Avoidable GFC}_{\text{Winter}}}{\text{Resource's QC}_{\text{Winter}} \times N_{\text{Winter}}}$$

Resources that would like to submit contingent offers will receive two Resource-Specific Offer Caps, one for their summer offer and one for their winter offer. Since the resource is providing capacity through the entire annual Commitment Period, it must be able to recover its total annual avoidable net GFC across the two seasons. The Resource-Specific Offer Caps for contingent summer and winter offers include all the costs that would be avoided if the resource does not have a Capacity Obligation for the entire Commitment Period covered by the auction (one year).

The Resource-Specific Offer Caps for summer and winter contingent resource takes the total annual avoidable net GFC of the resource and allocates it to the summer and winter seasons. The equation 4 divides the portion of the annual net avoidable GFC by the product of the qualified capacity in that season and the business days in the season.

Equation 4: Resource-Specific Offer Cap Formula for Summer and Winter Contingent Offers

$$\begin{aligned} & \text{Summer Contingent Resource – Specific Offer Cap} \\ = & \frac{\text{Resource's Net Avoidable GFC}_{\text{Annual}} \times \text{Summer Allocation \%}}{\text{Resource's QC}_{\text{Summer}} \times N_{\text{Summer}}} \\ & \text{Winter Contingent Resource – Specific Offer Cap} \\ = & \frac{\text{Resource's Net Avoidable GFC}_{\text{Annual}} \times (1 - \text{Summer Allocation \%})}{\text{Resource's QC}_{\text{Winter}} \times N_{\text{Winter}}} \end{aligned}$$

If the CAP requests Resource-specific Offer Caps for contingent summer and winter offers, it must determine in their Resource-specific Offer Cap request how to split their annual net avoidable GFC between the two seasons, which will determine their offer cap for each of the seasonal contingent offers. The CAP can elect to allocate the total annual net avoidable GFC of its resource between its winter and summer offers as it sees fit, as long as the total cost included in both offer caps is below the annual total net avoidable GFC and the costs spread between the summer and winter contingent offer caps meets the contingent offer submission restrictions detailed in section 8.1. Offer Submission.

A CAP may have a CAR that is in different situations in different seasons for the same Commitment Period. In such case, the CAP can submit different types of the Resource-Specific Offer Cap requests for the summer-

only and winter-only offers. However, the Resource-Specific Offer Cap requests for contingent Capacity Offers for that resource will assume full-year operations, i.e., the same type of the Resource-Specific Offer Cap for the entire commitment period must be requested.

The Resource-Specific Offer Cap formulas shown in Equation 1 –Equation 4 above apply to all resource types. The difference between resources is in the types of costs that are avoidable if the resource does not receive a Capacity Obligation. Therefore, the formulas shown in Equation 1 – Equation 4, with the appropriate total net avoidable GFC for each resource types, are used to determine the offer caps for all resource types. The next sections of the report discuss what types of costs are Net Avoidable GFC for different resource types.

Energy-only No-Capacity Obligation Offer Cap - Net Avoidable GFC

The Net Avoidable GFC for an Energy-only No-Capacity Obligation Offer Cap are shown in Equation 5.

Equation 5: Net Avoidable GFC for Energy-Only No-Capacity Obligation Offer Cap

$$\begin{aligned} & \text{Resource's Net Avoidable GFC}_{\text{Energy-Only}} \\ &= (\text{Avoidable Fuel Availability Expenses} + \text{Expected Avoided Non Performance Charges}) \times (1 \\ &+ \text{Cost Uncertainty Adder}) \end{aligned}$$

Where:

Avoidable Fuel Availability Expenses. Expenses incurred to ensure the availability of fuel. A resource with a Capacity Obligation may choose to incur these costs to reduce the likelihood it cannot perform in performance assessment hours and be assessed non-performance charges. Therefore, a resource without a Capacity Obligation can claim to avoid such expenses.

Expected Avoided Non-Performance Charges. The performance assessment process proposed by IESO will imply that resources take on risk when they have a Capacity Obligation. The expected value of the non-performance charges is avoidable if a resource does not take on a Capacity Obligation.

Cost Uncertainty Adder. CAPs can account for the uncertainty of their costs in their Resource-Specific Offer Cap. In order to include a buffer for cost uncertainty, CAPs can inflate their offer caps by 10%. The 10% cost uncertainty adder reflects the fact that estimating the net avoidable GFC of a resource is very difficult, even a CAP may not know exactly what costs are avoidable or exactly how much those costs will be during the Obligation Period at the time of the auction. The 10% allows CAPs, if they deem it necessary to recover their costs, to include some of this cost uncertainty in their offer.

The table below provides specific examples of these cost categories.

Table 6 | Examples of Costs for Energy-Only No-Capacity Obligation Offer Cap

Cost Category	Examples of Costs to be Included	Examples of Costs Not to be Included
Avoidable Fuel Availability Expenses	Costs for firm gas procurement, storage, parking and loan services	Purchased fuel sunk costs
Expected Avoided Non-Performance Charges	Expected value of non-performance charges	Operating costs needed to maintain availability

Export Offer Cap - Net Avoidable GFC

The Net Avoidable GFC for an Export Offer Cap are shown in Equation 6. A CAR that plans to export capacity to another market will not avoid fixed operating and maintenance costs, as they will need to continue operating. Exporting resources are not likely to forfeit net E&AS revenues, nor are they likely to incur any costs to export. Therefore, the offer cap formula does not include these revenues and costs.

Equation 6: Net Avoidable GFC for Export Offer Cap

$$\begin{aligned}
 & \text{Resource's Net Avoidable } GFC_{\text{Export}} \\
 &= (\text{Avoidable Fuel Availability Expenses} + \text{Expected Avoided Non Performance Charges} \\
 &+ \text{Incurred Opportunity Costs}) \times (1 + \text{Cost Uncertainty Adder})
 \end{aligned}$$

Where:

Avoidable Fuel Availability Expenses. Expenses incurred to ensure the availability of fuel. A resource with a Capacity Obligation may choose to incur these costs to reduce the likelihood it cannot perform in performance assessment hours and be assessed non-performance charges. Therefore, a resource without a Capacity Obligation can claim to avoid such expenses.

Expected Avoided Non-Performance Charges. The performance assessment process proposed by IESO will imply that resources take on risk when they have a Capacity Obligation. The expected value of the non-performance charges is avoidable if a resource does not take on a Capacity Obligation.

Incurred Opportunity Costs. The opportunity cost in the case of an export resource is the price of capacity in the market where they are able to export, less any transmission fees or other costs they expect to incur when exporting capacity.

Cost Uncertainty Adder. CAPs can account for the uncertainty of their costs in their Resource-Specific Offer Cap. In order to include a buffer for cost uncertainty, CAPs can inflate their offer caps by 10%. The 10% cost uncertainty adder reflects the fact that estimating the net avoidable GFC of a resource is very difficult, even a CAP may not know exactly what costs are avoidable or exactly how much those costs will be during the Obligation Period at the time of the auction. The

10% allows CAPs, if they deem it necessary to recover their costs, to include some of this cost uncertainty in their offer.

The table below provides specific examples of these cost categories.

Table 7 | Examples of Costs for Export Offer Cap

Cost Category	Examples of Costs to be Included	Examples of Costs Not to be Included
Avoidable Fuel Availability Expenses	Costs for firm gas procurement, storage, parking and loan services	Purchased fuel sunk costs
Expected Avoided Non-Performance Charges	Expected value of non-performance charges	Operating costs needed to maintain availability
Incurred Opportunity Costs	Lost export capacity payments or net revenues from business operation	

Mothball Offer Cap - Net Avoidable GFC

The Net Avoidable GFC for a Mothball Offer Cap are shown in Equation 7. The avoided costs for this category of CARs will vary depending on the exact plans for the resource if it does not clear the Capacity Auction. For example, resources that plan to mothball will avoid fixed operating and maintenance costs, as well as any other cost that can be avoided by ceasing operations during the commitment period. A mothballing resource will defer any capital costs needed to keep the resource online and operating until it comes back online. If the resource comes out of mothball and offers into a later Capacity Auction, it will only be able to include the deferred investment if it is still requesting a mothball or deregistration offer cap. Mothballing resources will lose net revenues from the E&AS markets and they will incur the costs needed to mothball the resource. Therefore, their avoidable costs are reduced by the expected net E&AS revenues and the expected mothballing expense.

Equation 7: Net Avoidable GFC for Mothball Offer Cap

$$\begin{aligned}
 & \text{Resource's Net Avoidable GFC}_{\text{Mothball}} \\
 = & (\text{Amortized Avoidable Capital Costs} + \text{Avoidable Fixed O\&M Costs} + \text{Avoidable Administrative Costs} \\
 & + \text{Avoidable Non Generation Variable Costs} + \text{Avoidable Inventory Carrying Charges} \\
 & + \text{Avoidable Fuel Availability Expenses} + \text{Expected Avoided Non Performance Charges} \\
 & - \text{Lost Net E\&AS Revenue} - \text{Mothballing Costs}) \times (1 + \text{Cost Uncertainty Adder})
 \end{aligned}$$

Where:

Amortized Avoidable Capital Costs. This category includes large capital expenditures needed to keep the resource online and operating. These can include major investments for new equipment at the resource (e.g., a new boiler or turbine), as well as investments needed for environmental

compliance. The costs of large capital expenditures are generally recovered over many years, implying that they can be treated differently than the other cost categories in the Resource-Specific Offer Cap formulas. A sub-section of this document describes Amortization of Capital Costs process in detail.

Avoidable Fixed O&M Costs. This category includes any fixed operations and maintenance costs needed to keep the resource online and operational for the commitment period. This can include labor or capital expenditures that are incurred each year (or on a regular multi-annual cycle). The amount of fixed O&M that is avoidable will depend on the resource situation. A resource planning to mothball is likely to avoid some portion of their fixed O&M costs but not all. The IESO will provide further details as to what Fixed O&M Costs will be considered avoidable in the Market Manual.

Avoidable Administrative Costs. Administrative costs include insurance, taxes, or other fees that are avoided by not operating the plant. A resource planning to mothball will avoid some of these cost. This cost category does not include corporate income taxes on the resource's net revenues, those taxes are accounted for in the E&AS offset or the amortized capital costs.

Avoidable Non Generation Variable Costs. Variable costs that are not directly related to the production of power at the resource. This could include water or electric power consumed for station service at the resource. A resource planning to mothball would likely avoid most of these costs.

Avoidable Inventory Carrying Charges. Includes costs related to storing materials, parts, fuel or other durable items need to operate the resource. Generally, this cost category pertains to resources that have on site fuel storage capabilities that can be avoided if the resource is not operating. A resource planning to mothball is likely to avoid all costs in this category.

Avoidable Fuel Availability Expenses. Expenses incurred to ensure the availability of fuel. A resource with a Capacity Obligation may choose to incur these costs to reduce the likelihood it cannot perform in performance assessment hours and be assessed non-performance charges. Therefore, a resource without a Capacity Obligation can claim to avoid such expenses.

Expected Avoided Non-Performance Charges. The performance assessment process proposed by IESO will imply that resources take on risk when they have a Capacity Obligation. The expected value of the non-performance charges is avoidable if a resource does not take on a Capacity Obligation.

Lost Net E&AS Revenue. A resource that plans mothball if it does not clear the Capacity Auction will lose all future net revenues from the energy and ancillary service markets. An estimate of future energy and ancillary service revenues, less costs and adjusted for taxes, will be calculated by IESO for each resource and subtracted from its Resource-Specific Offer Cap.

Mothballing Costs. Mothball resources are likely to incur costs in the process of mothballing. The expected mothballing costs would not be incurred if the resource stayed online and provided capacity, and are subtracted from the resource's offer cap.

Cost Uncertainty Adder. CAPs can account for the uncertainty of their costs in their Resource-Specific Offer Cap. In order to include a buffer for cost uncertainty, CAPs can inflate their offer caps by 10%. The 10% cost uncertainty adder reflects the fact that estimating the net avoidable GFC of a resource is very difficult, even a CAP may not know exactly what costs are avoidable or exactly how much those costs will be during the Obligation Period at the time of the auction. The 10% allows CAPs, if they deem it necessary to recover their costs, to include some of this cost uncertainty in their offer.

Table 8 below provides specific examples of these cost categories.

Table 8 | Examples of Costs for Mothball Offer Cap

Cost Category	Examples of Costs to be Included	Examples of Costs Not to be Included
Amortized Avoidable Capital Costs	Capital expenditures needed to keep resource operating, environmental compliance (including installation and interest during construction)	Previous capital expenditures projects and debt servicing
Avoidable Fixed O&M Costs	Chemicals and materials consumed for maintenance, rented equipment, labor need to run the resource, warranties and service contracts	Deregistration and Mothballed labor, prior maintenance, other sunk costs
Avoidable Administrative Costs	Administrative salaries, Environmental fees, Safety and operator training	Corporate overhead/ administrative costs
Avoidable Non Generation Variable Costs	Water, gas, and electric service; water treatment chemicals and waste water treatment costs	Long-term waste fuel storage costs (e.g., nuclear spent fuel storage)
Avoidable Inventory Carrying Charges	Stored fuel, spare parts, other inventories	Working capital, debt servicing
Avoidable Fuel Availability Expenses	Costs for firm gas procurement, storage, parking and loan services	
Expected Avoided Non-Performance Charges	Expected value of non-performance charges. Operating costs needed to maintain availability.	
Lost Net E&AS Revenues	Expected net revenues in the energy or ancillary service markets, out of market payments (e.g., CMSC), and clean energy payments	Reliability must run contracts
Mothballing Costs	Capital expenditures or O&M needed while resource is mothballed	

Deregistration Offer Cap - Net Avoidable GFC

The Net Avoidable GFC for a Deregistration Offer Cap are shown in Equation 8.

Equation 8: Net Avoidable GFC for Deregistration Offer Cap

$$\begin{aligned} & \text{Resource's Net Avoidable GFC}_{\text{Deregistration}} \\ &= (\text{Amortized Avoidable Capital Costs} + \text{Avoidable Fixed O\&M Costs} + \text{Avoidable Administrative Costs} \\ &+ \text{Avoidable Non Generation Variable Costs} + \text{Avoidable Inventory Carrying Charges} \\ &+ \text{Avoidable Fuel Availability Expenses} + \text{Expected Avoided Non Performance Charges} \\ &+ \text{Remaining Life Costs} - \text{Lost Net E\&AS Revenue} - \text{Deregistration Costs}) \times (1 + \text{Cost Uncertainty Adder}) \end{aligned}$$

Where:

- **Amortized Avoidable Capital Costs.** This category includes large capital expenditures needed to keep the resource online and operating. These can include major investments for new equipment at the resource (e.g., a new boiler or turbine), as well as investments needed for environmental compliance. The costs of large capital expenditures are generally recovered over many years, implying that they can be treated differently than the other cost categories in the Resource-Specific Offer Cap formulas. An Amortization of Capital Costs process is described in detail below in this sub-section.
- **Avoidable Fixed O&M Costs.** This category includes any fixed operations and maintenance costs needed to keep the resource online and operational for the commitment period. This can include labor or capital expenditures that are incurred each year (or on a regular multi-annual cycle). The amount of fixed O&M that is avoidable will depend on the resource situation. A resource that is planning to deregister will likely avoid all fixed O&M. The IESO will provide further details as to what Fixed O&M Costs will be considered avoidable in the Market Manual.
- **Avoidable Administrative Costs.** Administrative costs include insurance, taxes, or other fees that are avoided by not operating the plant. A resource that is planning to deregister will likely avoid all of these costs. This cost category does not include corporate income taxes on the resource's net revenues, those taxes are accounted for in the E&AS offset or the amortized capital costs.
- **Avoidable Non Generation Variable Costs.** Variable costs that are not directly related to the production of power at the resource. This could include water or electric power consumed for station service at the resource. A resource that is planning to deregister would likely avoid all of these costs.
- **Avoidable Inventory Carrying Charges.** Includes costs related to storing materials, parts, fuel or other durable items needed to operate the resource. Generally, this cost category pertains to

resources that have on site fuel storage capabilities that can be avoided if the resource is not operating. A resource that is planning to deregister is likely to avoid all costs in this category.

- **Avoidable Fuel Availability Expenses.** Expenses incurred to ensure the availability of fuel. A resource with a Capacity Obligation may choose to incur these costs to reduce the likelihood it cannot perform in performance assessment hours and be assessed non-performance charges. Therefore, a resource without a Capacity Obligation can claim to avoid such expenses.
- **Expected Avoided Non-Performance Charges.** The performance assessment process proposed by IESO will imply that resources take on risk when they have a Capacity Obligation. The expected value of the non-performance charges is avoidable if a resource does not take on a Capacity Obligation.
- **Remaining Life Costs.** A resource that is planning to deregister if it does not clear the Capacity Auction will avoid all future fixed O&M costs for the remaining life of the resource, not just the expected fixed O&M during the Commitment Period covered by the auction. Therefore, the resource that is planning to deregister can be allowed to include the NPV of all projected avoidable fixed O&M costs for the remaining life of the asset.
- **Lost Net E&AS Revenue.** A resource that plans to deregister if it does not clear the Capacity Auction will lose all future net revenues from the energy and ancillary service markets. An estimate of future energy and ancillary service revenues, less costs and adjusted for taxes, will be calculated by IESO for each resource and subtracted from its Resource-Specific Offer Cap.
- **Deregistration Costs.** This cost category includes any costs the resource will incur in the process of deregistering, the largest component of which are generally deregistration costs. The Resource-Specific Offer Cap of a resource that is planning to deregister is reduced by the costs incurred in the process of deregistering.
- **Cost Uncertainty Adder.** CAPs can account for the uncertainty of their costs in their Resource-Specific Offer Cap. In order to include a buffer for cost uncertainty, CAPs can inflate their offer caps by 10%. The 10% cost uncertainty adder reflects the fact that estimating the net avoidable GFC of a resource is very difficult, even a CAP may not know exactly what costs are avoidable or exactly how much those costs will be during the Obligation Period at the time of the auction. The 10% allows CAPs, if they deem it necessary to recover their costs, to include some of this cost uncertainty in their offer.

The table 9 below provides specific examples of these cost categories.

Table 9 | Examples of Costs for Deregistration Offer Cap

Cost Category	Examples of Costs to be Included	Examples of Costs Not to be Included
Amortized Avoidable Capital Costs	Capital expenditures needed to keep resource operating, environmental compliance (including installation and interest during construction)	Previous capital expenditures projects and debt servicing
Avoidable Fixed O&M Costs	Chemicals and materials consumed for maintenance, rented equipment, labor need to run the resource, warranties and service contracts	Deregistration and mothballed labor, prior maintenance, other sunk costs
Avoidable Administrative Costs	Administrative salaries, Environmental fees, Safety and operator training	Corporate overhead/ administrative costs
Avoidable Non Generation Variable Costs	Water, gas, and electric service; water treatment chemicals and waste water treatment costs	Long-term waste fuel storage costs (e.g., nuclear spent fuel storage)
Avoidable Inventory Carrying Charges	Stored fuel, spare parts, other inventories	Working capital, debt servicing
Avoidable Fuel Availability Expenses	Costs for firm gas procurement, storage, parking and loan services	
Expected Avoided Non-Performance Charges	Expected value of non-performance charges. Operating costs needed to maintain availability.	
Remaining Life Costs	Net present value of avoided operating costs less E&AS offset over the remaining life of the resource	Deregistration costs
Lost Net E&AS Revenues	Expected net revenues in the energy or ancillary service markets, out of market payments (e.g., CMSC), and clean energy payments	Reliability must run contracts
Deregistration Costs	Deregistration costs	Unavoidable debt servicing

Amortization of Capital Costs

IESO will use the approach to amortizing capital costs that will allow for a portion of the capital costs to be included in the offer cap for several years after the initial investment.

Number of years that investment costs can be included as part of the Deregistration and Mothball Offer Caps will be limited to the life cycle of the capital investment and capped at 10 years. IESO considers life cycle of the investment to be the number of years until a similar investment will be needed again.

The portion of investment cost that are allowed to be included in the Deregistration and Mothball Offer Caps each year will be consistent with Ontario's investment environment. Table 5 indicates the portion of the capital expenditures that will be allowed in the offer cap each year, depending on the life cycle of the capital expenditure.

Table 10 | Portion of Investment Costs Included in Resource-Specific Offer Caps

Life Cycle of the Capital Expenditure	Portion of Capital Expenditure Included
1 Year	1.00
2 Years	0.56
3 Years	0.39
4 Years	0.31
5 Years	0.26
6 Years	0.23
7 Years	0.20
8 Years	0.19
9 Years	0.17
10+ Years	0.16

The table 5 calculates a different portion of the investment costs for each possible investment life cycle from two years to ten years. Any avoidable investment that would need to be repeated each year can have 100% of its costs included in the first year, while any investment that is expected to have a life cycle longer than ten years would be treated like a 10-year investment. The Capital Expenditure Amortization Factor shown in Table 5 is applied to the avoidable capital costs incurred by the CAR to determine the Amortized Avoidable Capital Costs that can be included in the CAR's Net Avoidable GFC for Deregistration and Mothball Offer Cap, as shown in Equation 9.

Equation 9: Calculation of Amortized Avoidable Capital Costs

Amortized Avoidable Capital Costs

= Incurred Avoidable Capital Costs × Capital Expenditures Amortization Factor

This methodology was designed to allow the CAP to recover the capital expenditures over the life cycle of the investment, plus a fair return based on the appropriate after-tax discount rate for an investor in Ontario.

Only capital expenditures that are incurred after the resource comes off of supply contract should be eligible for inclusion in the Resource-Specific Offer Caps. If a resource invested while still under a supply contract it cannot include any portion of those investments in its Resource-Specific Offer Cap.

Appendix C provides further context and rationale for the proposed approach.

Energy and Ancillary Services Revenue Calculation Methodology for Generation Facilities

The Energy and Ancillary Services (E&AS) Revenue will be used to calculation of the Net Avoidable GFC for all Resource-Specific Offer Caps for generation facilities. This is done to account for the expected net revenues earned by the resource in the energy and ancillary services markets during the Commitment Period covered by the auction.

The E&AS Revenue represents the estimate of revenues earned in the energy and ancillary services markets during the future Commitment Period, less the variable operating cost incurred to earn those revenues. This includes net revenues generated by the resource for other market services or products. In Ontario, prior to the transition to the Single-Schedule Market (SSM) the E&AS Revenue would also include congestion management payments (CMSC) received by the resource.

The IESO will estimate E&AS Revenue using the historical approach, which uses the recent realized energy revenues and costs as a proxy for net E&AS Revenues during the Commitment Period covered by the auction. The historical approach includes the three steps below that IESO will follow to calculate E&AS Revenue for all resources requesting Resource-Specific Offer Caps:

- 1) Use the settlements data to sum all the revenues received by the resource over the most recent three years, including energy and ancillary services payments plus Congestion Management Settlement Credits (CMSC).
- 2) All the variable costs incurred by the resource over the last three years will be totaled and subtracted from the sum of revenues calculated in (1). The variable costs of the resources will be determined

using the variable and start-up costs offered by the resource into the energy markets during the hours when they were operated.

- 3) The net revenue remaining after total settlements will be reduced by the total variable costs and averaged over the last three historical years, which will be the E&AS Revenue for the resource in the obligation period covered by the auction.

For resources that do not have three years of historical data to rely on for this calculation, the IESO will use the historical average for the resource class applicable to such resource.

The IESO will revisit this approach for calculation E&AS Revenue after the transition to Single Schedule Market is complete.

Appendix C provides further context and rationale for the proposed approach.

Demand Response Offer Cap – Resource’s Net Avoidable GFC

Equation 10: Net Avoidable GFC for Demand Response Offer Cap

$$\begin{aligned} & \text{Resource's Net Avoidable GFC}_{\text{Demand Response}} \\ &= (\text{Avoidable Customer Capital Costs} + \text{Avoidable Customer Acquisition Costs} \\ &+ \text{Avoidable Customer Retention Costs} + \text{Avoidable Network O\&M Costs} \\ &+ \text{Expected Avoided Non Performance Charges} + \text{Net Cost of Test Activations} \\ &+ \text{Net Cost of Expected EOSCA Events}) \times (1 + \text{Cost Uncertainty Adder}) \end{aligned}$$

Where:

Avoidable Customer Capital Costs. Costs associated with the installation of metering, communication, and other necessary equipment for bringing DR customers online.

Avoidable Customer Acquisition Costs. Initial customer incentives needed to sign up DR resources, including sales representative commissions and other customer acquisition costs.

Avoidable Customer Retention Costs. On-going customer payments to existing DR customers (often referred to as “revenue sharing”), and other costs of maintaining and retaining customers. This cost component may or may not include all customer retention cost and revenue sharing. It should reflect only those costs that would be eliminated if the resource does not take on a Capacity Obligation (any payments that would continue to be made as associated with continued energy market participation would not be factored into this cost component).

Avoidable Network O&M Costs. Network operating center costs, such as capital and fixed costs (only those that are avoidable on a going-forward basis), and incremental costs associated with incremental quantities of DR resources including dispatch, data management and verification, IT costs, payments and settlements management, and administrative costs.

Expected Avoided Non-Performance Charges. Net costs associated with any potential expected non-performance charges for non-performance with a Capacity Obligation.

Net Costs of Test Activations. The net costs associated with anticipated test activations, which a DR resource is subject to four times a year if it has a Capacity Obligation. Calculating this component will require the DR participant to report the cost of activation for the resource, which may be submitted as a fixed component (\$ per activation), variable component (\$ per MW-hour of activation), or both. Using this information, the IESO will calculate the net cost of testing as the net activation cost less the revenues provided in compensation for the activation (\$250/MWh HDR resources and the resource's energy market offer for Dispatchable Load). This will determine the net cost of each test activation for the resource and multiply by the number of expected test in the *obligation period*. HDR resources are subject to four tests per year, with a minimum of one in each season. Dispatchable Load resources may also be tested up to four times per year.

Net Costs of EOSCA Events. The net costs associated with anticipated EOSCA¹⁶ activations. Calculating this component will require understanding the cost of activation for the DR resource (as with net testing activation costs). Once this information is submitted, the IESO will also need to estimate the number of EOSCA activations the resource will experience, which can be estimated based on historical practice. Net revenues are then calculated as the expected number of EOSCA-related activations times the net cost/revenue from each activation.

Cost Uncertainty Adder. Accounts for the fact that costs are unknown at the time the CAP submits cost to the IESO for the calculation of the offer caps. In order to include a buffer for cost uncertainty, CAPs can inflate their offer caps by 10%. The 10% cost uncertainty adder reflects the fact that estimating the net avoidable GFC of a resource is very difficult, even a CAP may not know exactly what costs are avoidable or exactly how much those costs will be during the Obligation Period at the time of the auction. The 10% allows CAPs, if they deem it necessary to recover their costs, to include some of this cost uncertainty in their offer.

Lost net E&AS revenues will not be included in the Resource-Specific Offer Caps for demand response (DR) CARs. Given that DR CARs operate infrequently in the E&AS markets, and have relatively high operating costs, their net E&AS revenues are likely to be relatively small compared to generation facilities.

Moreover, excluding net E&AS revenues is a conservative approach that will result in Resource-Specific Offer Cap estimates on the higher end of the uncertainty range for DR resources, and reduces the risk a mitigated resource that clears the auction will not recover all their avoidable costs.

The table below provides specific examples of these cost categories.

¹⁶ Emergency Operating State Control Actions (EOSCA)
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Table 11 | Examples of Costs for Demand Response Offer Cap

Cost Category	Examples of Costs to be Included	Examples of Costs Not to be Included
Avoidable Customer Capital Costs	Installation of metering and communication equipment	Prior capital investments and debt servicing
Avoidable Customer Acquisition Costs	Sales commissions and marketing costs related to new customers. While new DR assets in the Capacity Auction will not be subject to offer cap mitigation, this cost category may still apply as incremental costs for existing DR assets for example as applicable for existing aggregated resources with a rolling set of qualified customers or incremental capital costs incurred to enhance operational capabilities.	
Avoidable Customer Retention Costs	Avoidable revenue sharing agreements and other customer payments	
Avoidable Network O&M Costs	Operating center costs, including dispatch, data management and verification, IT costs, payments and settlements management, and administrative costs	Sunk capital investment costs
Expected Avoided Non-Performance Charges	Expected value of non-performance charges	
Net Cost of Test Activations	Avoidable net revenues due to test activations mandated with a Capacity Obligation. Includes compensation for activations net of the costs associated with activation (VOLL call value, less avoided retail energy costs and payments related to activation).	Unavoidable activation costs for Dispatchable Load resources due to energy market participation
Net Cost of EOSCA Events	Avoidable net revenues (or costs) due to EOSCA activations. Includes compensation for activations net of the costs associated with activation (VOLL call value, less avoided retail energy costs and activation payments).	Unavoidable activation costs for Dispatchable Load resources due to energy market participation
Cost Uncertainty Adder	Percentage adder to increase offer cap to account for uncertainty in avoidable costs	

Appendix C – Brattle Report

The Brattle Report is available on the [Capacity Auction Stakeholder Engagement Webpage](#).

Appendix D – Settlement Summary

Charge Code	Settlement Charge	Applicability	Rationale	Participating Capacity Auction Resources						
				Dispatchable Loads	Dispatchable Generation	Hourly DR	System-Backed Capacity Resources	Capacity Storage Resources	Generator-backed Capacity Resources	Capacity Self-Scheduling Generation and Storage
1314	Availability Payment	When there is a Capacity Obligation	Payment to capacity resources for making themselves available in the energy market.	Applicable to all resource types						
1315	Availability Charge	When Availability Requirements are not met	Non-performance charge - Failure to provide DR Energy Bids / Offer in every hour of the Availability Window. This charge is meant to incentivize availability of the capacity resources.	Applicable to all resource types						

Charge Code	Settlement Charge	Applicability	Rationale	Participating Capacity Auction Resources						
				Dispatchable Loads	Dispatchable Generation	Hourly DR	System-Backed Capacity Resources	Capacity Storage Resources	Generator-backed Capacity Resources	Capacity Self-Scheduling Generation and Storage
1316	Administration Charge	When measurement data is not submitted by the deadline	Non-performance charge – applicable to resources that must submit data to the IESO for the purpose of a performance assessment.	Not-Applicable	Not-Applicable	Applicable to HDR resources with virtual contributors. HDR resources must submit measurement data for IESO to assess performance for activations (in-market or test). This charge is meant to incentivize timely measurement data submission for HDR resources with virtual contributors.	Not-Applicable	Not-Applicable	Applicable – resources must submit measurement data for the IESO to assess performance for activations	Not-Applicable
1317	Dispatch Charge	This charge will be removed and will not apply to any resources.								

Charge Code	Settlement Charge	Applicability	Rationale	Participating Capacity Auction Resources						
				Dispatchable Loads	Dispatchable Generation	Hourly DR	System-Backed Capacity Resources	Capacity Storage Resources	Generator-backed Capacity Resources	Capacity Self-Scheduling Generation and Storage
1318	Capacity Charge	When failing to deliver capacity in the energy market including a failed test activation	Nonperformance charge – Applied to capacity market participants as a frontline deterrent for nonperformance of capacity delivery and ensure capacity is provided during the entire activation period.	Applicable to all resource types, subject to the performance criteria in a test activation						
1319	Buy-out charge	When participant decides to buy-out a capacity obligation partially or in full	The buy out charge will include any true up to availability payments made to participant who acquire capacity obligation at a clearing price higher than the zonal clearing price	Applicable to all resource types						

Charge Code	Settlement Charge	Applicability	Rationale	Participating Capacity Auction Resources						
				Dispatchable Loads	Dispatchable Generation	Hourly DR	System-Backed Capacity Resources	Capacity Storage Resources	Generator-backed Capacity Resources	Capacity Self-Scheduling Generation and Storage
1320	Out of market activation payment	When activated for test or during or leading up to an emergency operating state	Compensation provided to resources that are not eligible for CMSC	Not Applicable	Not Applicable	Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
1321	Availability charge true-up	When making capacity available in excess of the capacity obligation	To align with the qualification methodologies	Applicable to all resource types						



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