

High Level Design: Energy Efficiency Auction Pilot

Issue: 1.0

Issue Date: February 28, 2020

Contents

- 1. Introduction..... 4**
 - 1.1. PILOT AUCTION CONTEXT AND OBJECTIVES 4
- 2. Pilot Auction Overview 7**
 - 2.1. THE ENERGY EFFICIENCY CAPACITY PRODUCT 7
 - 2.1.1. Demand Reduction Window..... 7
 - 2.1.2. Commitment Period 8
 - 2.1.3. Zonal Constraints..... 8
 - 2.2. AUCTION PROCESS 8
- 3. Resource Eligibility..... 9**
 - 3.1. ENERGY EFFICIENCY RESOURCE DEFINITION..... 9
 - 3.2. MEASURE ELIGIBILITY 9
 - 3.2.1. Other Funding Sources..... 10
 - 3.2.2. Interaction with Other Load Flexibility Initiatives..... 10
 - 3.3. FACILITY ELIGIBILITY 10
 - 3.3.1. Facility Participation in the Industrial Conservation Initiative 10
 - 3.3.2. Facility Participation as an HDR Resource in the IESO-Administered Markets 11
 - 3.3.3. Facility Participation as a Dispatchable Load in the IESO-Administered Markets. 12
 - 3.4. MINIMUM AND MAXIMUM ENERGY EFFICIENCY RESOURCE SIZE 12
- 4. Pilot Auction Participant Eligibility..... 13**
 - 4.1. PILOT AUCTION PARTICIPANT ELIGIBILITY 13
- 5. Auction Design 14**
 - 5.1. AUCTION FORMAT..... 14
 - 5.2. OFFER FORMAT..... 15
 - 5.3. AUCTION CLEARING 16
 - 5.3.1. Auction Price Cap..... 16
 - 5.3.2. Minimum and Maximum Capacity Limits..... 16
 - 5.3.3. Energy Efficiency Resource Capacity Obligation Limits 16
- 6. Pre-Auction Requirements..... 17**
 - 6.1. PRE-AUCTION PERIOD..... 17
 - 6.1.1. Energy Efficiency Capacity Enrollment..... 17
- 7. Auction Period 18**
 - 7.1. OFFER SUBMISSION AND VALIDATION 18

7.2.	AUCTION CLEARING	18
7.3.	POST AUCTION REPORTING	18
8.	Forward Period Requirements	19
8.1.	AUCTION PARTICIPANT AGREEMENT UPDATE.....	19
8.2.	ONLINE IESO REGISTRATION	19
8.3.	ENERGY EFFICIENCY RESOURCE PLAN UPDATE	19
8.4.	ENERGY EFFICIENCY RESOURCE REPORT AND M&V PLAN.....	20
8.4.1.	<i>Energy Efficiency Resource Report</i>	<i>20</i>
8.4.2.	<i>M&V Plan.....</i>	<i>21</i>
9.	Commitment Period Requirements	22
9.1.	ENERGY EFFICIENCY CAPACITY DELIVERY	22
9.1.1.	<i>Measurement & Verification (M&V) Reporting.....</i>	<i>22</i>
10.	Settlement.....	23
10.1.	NON-PERFORMANCE PENALTIES	24
11.	Relinquishment of Energy Efficiency Capacity Obligation	25
12.	Timelines.....	26
13.	Glossary.....	29

Copyright © 2020 Independent Electricity System Operator. All rights reserved

1. Introduction

This high-level design explains the purpose and outlines the proposed design of the IESO's Energy Efficiency (EE) Auction Pilot. The document aims to provide potential auction participants with the information they need to make informed decisions about whether to participate and, if applicable, begin identifying potential resources that could be offered into the auction.

The IESO will publish a second document – the detailed design – that will:

- Present further information on auction mechanics;
- Share the agreement by which successful auction participants will assume an obligation to deliver *energy efficiency capacity*;
- Confirm Measurement & Verification procedures;
- Establish detailed requirements for submitting energy efficiency resources for capacity enrollment and verifying eligibility to participate in the auction;
- Communicate detailed instructions for submitting offers to the auction; and
- Confirm dates for capacity enrollment, the auction, capacity delivery, and reporting obligations.

Similar to the high-level design, the draft detailed design will be shared with external stakeholders for feedback before it becomes final.

Please note that certain terms in this document are italicized to indicate that they are key terms defined in the glossary. Please also note that the high-level design sometimes refers to general concepts concerning capacity auctions, such as “capacity” and “enrollment.” The use of these terms may not reflect the terms set out in the IESO Market Rules, the final terms to be proposed in connection with the Energy Efficiency Auction Pilot, or the IESO's general interpretation of these terms in relation to other programs or aspects of the Market Rules.

1.1. PILOT AUCTION CONTEXT AND OBJECTIVES

In the last decade, a number of jurisdictions in the U.S. and Europe have made the transition from the use of traditional programs to secure energy efficiency to market-based approaches, such as auctions or tenders, to meet some or all of their energy efficiency needs. These mechanisms have reduced the cost of procuring energy efficiency, echoing the IESO's experience transitioning the procurement of demand response from programs to the Demand Response Auction.

Concurrently, a number of independent system operators and regional transmission operators (ISO/RTOs), including the Independent System Operator of New England (ISO-NE), the PJM Interconnection (PJM), and the Midcontinent Independent System Operator (MISO), have enabled energy efficiency to participate in their forward capacity auctions.

Leveraging the IESO's Grid Innovation Fund, the IESO will pilot an energy efficiency auction to inform long-term discussions about enabling this resource to compete to meet system needs through an appropriate market-based mechanism. In particular, the IESO is seeking to understand the receptivity of this market to participating in auction-style procurements, as well as the benefits to the system of acquiring energy efficiency through this type of competitive mechanism. For clarity, the pilot auction will only run once.

Among other objectives, the pilot aims to:

- Assess the interest and ability of different sectors (e.g., local distribution companies, sophisticated large or multi-site customers, energy service companies) to compete to provide energy efficiency *capacity* through an auction mechanism;
- Discover the price of *energy efficiency capacity* with competition for delivery enabled;
- Evaluate the strengths and weaknesses of Measurement & Verification (M&V) procedures for confirming capacity contributions from these resources; and
- Assess the unique characteristics of *energy efficiency resources* (e.g., implementation timeline, deliverability, savings persistence) versus traditional supply resources.

The IESO is currently responsible for the design and delivery of a suite of energy efficiency programs for businesses, Indigenous communities, and low-income consumers through the 2019-2020 Ontario Interim Energy Efficiency Framework. At the same time, the IESO is working with government to determine how energy efficiency can continue to meet system needs, as well as other policy objectives beyond 2020. The Energy Efficiency Auction Pilot is intended to complement other potential post-2020 initiatives and inform IESO options for enabling EE to compete to meet projected reliability needs in the mid-2020s time frame.

The IESO appreciates that the pilot's exclusive focus on demand reduction and load shifting during specific time periods may make some EE measures historically incented through IESO-administered programs uncompetitive. In keeping with the IESO's focus on enabling competition and meeting system requirements, the pilot seeks to more closely align procurement of EE with the anticipated needs of the bulk electricity system.

Among other considerations, the design features a number of decisions that reflect the:

- Intent to execute a single auction on a pilot basis rather than create an enduring mechanism;
- Desire to facilitate broad participation in what is a novel procurement mechanism for this market; and
- Practical need to contain the administrative obligations placed on the IESO.

If, in the future, the IESO implements a recurring auction specifically for energy efficiency or enables participation in the primary Capacity Auction, there would inevitably be a number of significant design differences between the pilot and the enduring auction mechanism.

2. Pilot Auction Overview

2.1. THE ENERGY EFFICIENCY CAPACITY PRODUCT

The auction will procure capacity in the form of verified reductions in electricity demand from *energy efficiency resources* during specific hours of the day – the *demand reduction window* – during winter and summer *obligation periods* over the one-year *commitment period*.

For the purposes of the pilot, the verified demand reduction delivered by *energy efficiency resources* will be referred to as energy efficiency (EE) capacity and expressed in units of kW_{WINTER} and kW_{SUMMER}. Demand reductions will be measured as the average reduction during the demand reduction window hours in a given *obligation period* in accordance with the *EE Auction Pilot M&V Procedures*.

2.1.1. Demand Reduction Window

The timing of the demand reduction windows will vary by obligation period. Auction participants may compete to provide energy efficiency capacity for one or both of the obligation periods over the one-year commitment period.

Figure 1: Timing of Obligation Periods and Demand Reduction Windows¹

Obligation period	Demand reduction window
Summer – June 1 to August 31	Non-holiday weekdays, Hour Ending (HE) 13-21 (12 p.m. – 9 p.m. EST)
Winter – November 1 to February 28/29	Non-holiday weekdays, Hour Ending (HE) 17-21 (4 p.m. – 9 p.m. EST) ¹

The use of seasonal obligation periods reflects different demand characteristics and supply capabilities during the two seasons when Ontario experiences the greatest electricity demand. It also enables participation by resources that may be seasonal in nature (such as many heating and cooling measures). The timing of the *demand reduction windows* aligns with the timing of the availability windows of the IESO's existing capacity auction designs.

¹ Note that in accordance with IESO standard practice, summer hours do not reflect Daylight Saving Time.

The timing of the *obligation periods* represents a balance of the existing months considered in the IESO’s current *Evaluation, Measurement and Verification Protocols and Requirements* and expectations regarding when risk to resource adequacy is greatest during the 2020s.

2.1.2. Commitment Period

Energy efficiency resources successful in the auction will receive an obligation to deliver *energy efficiency capacity* during the summer and/or winter obligation period(s) they clear during the one-year period known as the *commitment period*.

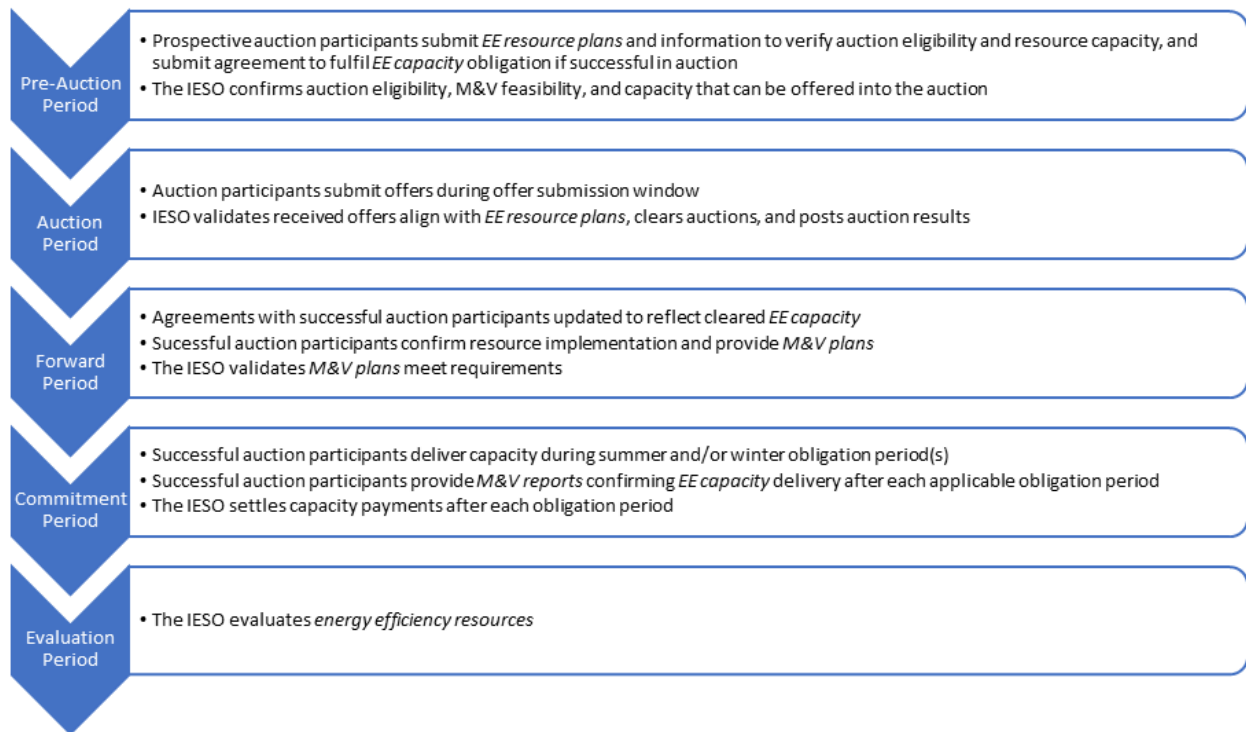
2.1.3. Zonal Constraints

Given the limited scale of the pilot and the static nature of *energy efficiency resources*, the auction will procure *energy efficiency capacity* on a provincial basis (i.e., there are no zonal constraints).

2.2. AUCTION PROCESS

The process for the pilot is described at a high level in Figure 2, and in greater detail in sections 6-10 and 12 of this document.

Figure 2: EE Auction Pilot process



3. Resource Eligibility

3.1. ENERGY EFFICIENCY RESOURCE DEFINITION

An *energy efficiency* resource is one or more **new measures** installed or implemented at one or more existing facilities that deliver a reduction in electricity demand during the defined *demand reduction windows*.

3.2. MEASURE ELIGIBILITY

A *measure* refers to:

- The behind-the-meter installation of more efficient equipment or implementation of more efficient processes and systems, exceeding current building codes, appliance standards, or other relevant standards;
- Or the installation of equipment or implementation of processes and systems shifting load outside of the defined *demand reduction windows*.

Once installed/implemented and commissioned, measures must provide demand reduction without requiring any notice, dynamic price signal, dispatch, or other operator intervention, while maintaining a comparable quality of service.

Any *measure* technically capable of responding to hourly or sub-hourly IESO dispatch instructions is ineligible for the pilot.

To qualify as new, the measure must not already be installed or implemented, and there must be no binding commitment to acquire the measure or services required to install or implement the measure prior to the publication of the post-auction report.²

For clarity, the following are not considered eligible measures:

- The displacement of load through behind-the-meter generation, including combined heat and power (CHP) and renewable energy generation sources, such as solar photovoltaic, wind, and biomass;
- The removal of equipment, processes, or systems, also referred to as load destruction;
- Consistent with current IESO EE programs, switching the input fuel source for equipment, process, or system to natural gas, diesel, or other carbon-emitting fuel source

² For clarity, the existence of a long-term facilities management or maintenance service contract will not impact measure eligibility.

(note the use of geothermal energy, solar-thermal energy, and deep lake cooling are eligible);

- Improvements to the efficiency of the transmission and distribution of electricity such as volt/VAR optimization (VVO) and conservation voltage regulation (CVR) projects, or initiatives related to reducing electricity theft; and
- The installation of electrical energy storage, or thermal storage dispatchable on an hourly or sub- hourly basis.

3.2.1. Other Funding Sources

Measures receiving incentives through current or future ratepayer-funded electricity energy efficiency programs, such as those offered by Save on Energy, are ineligible. Measures may receive funding from other sources, such as natural gas utility demand-side management incentive programs and federal greenhouse gas reduction incentive programs to deliver other non-electricity ratepayer or broader public value without compromising eligibility.

3.2.2. Interaction with Other Load Flexibility Initiatives

Additionally, any otherwise eligible measure that would require its operation to be shut down, cycled, or otherwise modified to comply with a demand-response (DR) activation or other market dispatch instruction is not considered eligible where this would impact the demand reduction that would have occurred under normal operating conditions. For example, the upgrade of water pumps with high- efficiency motors in an industrial facility would typically be considered an eligible *measure*. However, if the industrial facility were also to participate as a dispatchable load or directly as, or as a contributor to, an Hourly Demand Response (HDR) resource in the IESO-administered markets, and rely upon shutting down the water pumping process to comply with a DR activation or dispatch instructions, the project would not be considered an eligible measure for the purposes of this pilot. Please see 3.3.2 and 3.3.3 for further discussion regarding facility participation in other IESO load flexibility initiatives.

3.3. FACILITY ELIGIBILITY

Facilities must be connected to, or behind the meter of another electricity customer-connected to, the *IESO-Controlled Grid* or a *Distribution System* (i.e., projects at islanded facilities are not eligible) and possess meters approved and verified by Measurement Canada for measuring demand on an hourly or sub-hourly basis.

3.3.1. Facility Participation in the Industrial Conservation Initiative

Participation in the Industrial Conservation Initiative (ICI) will not impact facility eligibility.

3.3.2. Facility Participation as an HDR Resource in the IESO-Administered Markets

Non-dispatchable loads are currently able to participate in IESO's energy market as HDR resources, either directly or as a contributor to an aggregated resource. When activated, the performance of HDR resources is measured and verified by comparing energy consumption during the activation period against a baseline, an approximation of a resource's consumption profile that is used to estimate what the resource would have been consuming had a DR activation not taken place.

The baseline setting process varies for residential HDR resources and industrial, commercial and institutional (C&I) HDR resources. The former uses a randomized control trial methodology. The latter uses a "high 15 of 20" approach, which considers the highest 15 energy measurements for the activation hour during the previous 20 business days without a DR activation, with an in-day adjustment.

The use of a randomized control trial methodology means there is little risk that simultaneous residential HDR contributor participation as an *energy efficiency resource* would compromise measurement and verification of DR activation performance. Consequently, participating as a contributor to a residential HDR resource will not impact residential facility eligibility in the pilot.

However; the simultaneous participation of C&I HDR resource contributors in the pilot may impact measurement and verification of DR activation performance where the activation takes place within 20 days of the implementation of energy efficiency measures. However, the use of a rolling average of the highest 15 energy measurements diminishes the potential impact quickly. Furthermore, this risk of energy efficiency measure implementation (incented through existing IESO or LDC energy efficiency programs or non-incented) impacting measurement and verification of C&I HDR resources is not unique to the pilot and is currently uncontrolled. As a result, participation directly or as a contributor to a C&I HDR resource will not impact facility eligibility.

Minimum Measure Persistence

Measures constituting an *energy efficiency resource* must have a minimum effective useful life of two years (as confirmed by IESO during the *EE capacity* enrollment process).

3.3.3. Facility Participation as a Dispatchable Load in the IESO-Administered Markets

Participation as a dispatchable load in the IESO-administered markets will not impact *facility* eligibility in the pilot. However, these facilities may face challenges concerning measurement and verification of *energy efficiency capacity* delivery that will need to be accounted for in *EE resource plan* and *M&V plans* (e.g., installation of supplementary submetering may be required).

3.4. MINIMUM AND MAXIMUM ENERGY EFFICIENCY RESOURCE SIZE

An *energy efficiency resource*, which could be an aggregation of multiple *measures* at multiple facilities, must be confirmed to deliver at least 100 kW of *energy efficiency capacity* to participate in the pilot auction

The maximum energy efficiency resource size is the lesser of 3.25 MW (representing 25% of the maximum auction capacity limit), or the \$1.25M divided by the resource's offer price. The latter limit precludes a single resource from securing more than 50% of the budget in each obligation period.

4. Pilot Auction Participant Eligibility

4.1. PILOT AUCTION PARTICIPANT ELIGIBILITY

As the pilot aims to increase competition for the provision of energy efficiency, there are few restrictions on the types of organizations that can participate. A *pilot auction participant* must be an incorporated entity and may be a for-profit or not-for-profit organization. Participants may include large individual customers, multi-site customers, local distribution companies, private energy service companies, and non-profits serving specific sectors.

Requirements related to the financial soundness of *pilot auction participants* will be established during the detailed design phase of auction development.

Auction participants may be an:

- *Individual pilot auction participant* – offering *energy efficiency resources* located at facilities owned and/or operated by the participant
- *Aggregator pilot auction participant*– offering *energy efficiency resources* from a portfolio of facilities not owned and operated by the *pilot auction participant* but for which it has secured capacity rights.

Figure 3: Examples of pilot auction participant types

Auction participant	Proposed resource	Obligation period	Auction participant type
Municipal government	Chiller recommissioning at 12 municipal office buildings	Summer	Individual
Large manufacturer	Retrofit of 8 large pump motors with more efficient motors equipped with variable speed drives at factory	Summer and winter	Individual
Energy services company	Refrigeration upgrades at client's portfolio of grocery stores	Summer and winter	Aggregator
Local distribution company	Commercial lighting retrofit targeting warehouses and other facilities with significant continuous lighting needs	Summer and winter	Aggregator

Participants will not be required to have identified all constituent *facilities* of an *energy efficiency resource* at the time of the auction but will be obliged to submit a *EE resource plan* as part of the enrollment process. See 6.1.1 Energy Efficiency Capacity Enrollment, for further information.

For clarity, *pilot auction participants* will not need to be registered market participants.

5. Auction Design

5.1. AUCTION FORMAT

The pilot auction will use a pay-as-offer price, single-round, sealed-offer format, which means:

- Successful participants will be paid their offer price.
- Participants will submit their offers during a single round and will be able to submit multiple offers with different prices for different quantities of *energy efficiency capacity*. IESO will clear the auction based on the offers submitted during this single round.
- Offer information will not be visible to other participants during the auction, and the IESO will publish some offer information following the auction. See 7.3 Post-Auction Reporting, for further details.

The design is intended to facilitate broad participation and yield economically efficient outcomes, while minimizing complexity and enabling fast, affordable administration.

This design aligns with that of the IESO's existing capacity auction (and the majority of forward capacity auctions held by other North American system operators) with the exception of using pay-as-offer, rather than pay-as-clear pricing.

With pay-as-clear pricing, all successful auction participants receive the price of the last accepted (i.e., highest accepted) or first-rejected offer. In recurring auctions, this design achieves the most efficient long-run outcome as it incentivizes participants to bid/offer at their lowest acceptable price to maximize their chances of clearing the auction rather than strategize the highest bid/offer that will still clear the auction.³ For the purposes of a new one-time auction, the IESO will use a pay-as-offer design. The absence of historical auction results to inform offering strategy should encourage *pilot auction participants* to offer close to their lowest acceptable price. This design also minimizes the risk that limited participation in the pilot could produce a steep supply curve where the IESO pays at or near the auction price cap for all successful participants, significantly restricting both the quantity of *energy efficiency capacity* procured and pilot learnings.

³ Please refer to Section 8.4 of the *Incremental Capacity Auction High-Level Design* for discussion of auction design options and the merits of the pay-as-clear, single-round, closed-bid/offer design in recurring auctions

Different measures vary significantly in the length of time they remain in place and deliver demand reduction. This length of time is referred to as effective useful life (or persistence). To enable equitable evaluation of offers, for each of the seasonal obligation periods, offers will be ranked based on annualized cost per unit of *energy efficiency capacity*. For example, a \$400/kW offer for a project that delivers capacity during the winter obligation period with four-year persistence would have an annualized capacity cost of \$100/kW_{WINTER}. The *capacity annualization period* is capped at 10 years.

This maximum 10-year *capacity annualization period* balances the benefits of considering the differing persistence of different measures while containing the risk that changes to the timing of system needs reduces the value to the bulk electricity system of *energy efficiency capacity* delivered during the defined *demand reduction windows* and seasonal *obligation periods*.

5.2. OFFER FORMAT

Pilot auction participants will have the opportunity to submit offers to deliver energy efficiency capacity during one or both seasonal *obligation periods*. Each offer will indicate:

- The enrolled *energy efficiency resource* delivering the *energy efficiency capacity*
- The quantity of *energy efficiency capacity* available for a seasonal *obligation period* (minimum 100 kW) as confirmed by the IESO during the capacity enrollment process
- The offer price for a seasonal *obligation period*,
- The *capacity annualization period*, as confirmed by the IESO during the *energy efficiency capacity* enrollment process
- Whether the offer is contingent on the acceptance of an offer for the opposite season (i.e., an offer for summer capacity is only valid if a paired offer for winter capacity [or vice versa] is also accepted)

Pilot auction participants will be able to submit multiple offers with different price and quantity information for a single *energy efficiency resource*. For example, a participant may offer to deliver 200 kW of capacity at \$325/kW or 250 kW at \$300/kW. This allows participants to better reflect non-linear costs for delivering incremental *energy efficiency capacity* and the auction to clear with improved efficiency and price signals. The maximum number of offers that can be submitted concerning a single resource will be determined as part of the detailed design.

Pilot auction participants will be able submit contingent offers. That means they will be able to indicate whether an offer for summer capacity is only valid if a paired offer for winter capacity also clears (and vice versa).

The maximum quantity of *energy efficiency capacity* and *capacity annualization period* will be confirmed for each offered *energy efficiency resource* prior to the auction during the capacity enrollment process - see 6.1.1 Energy Efficiency Capacity Enrollment. *Pilot auction participants* may choose to offer less than their confirmed *energy efficiency capacity* for a given *energy efficiency resource* to reduce risk of underperformance.

5.3. AUCTION CLEARING

The IESO has allocated a budget of \$5M for the auction pilot revenue pool, which will be evenly distributed between the winter and summer *obligation periods* (i.e., \$2.5M each). The IESO will rank offers based on annualized capacity cost (\$/kWYEAR_{-WINTER/SUMMER}) for each *seasonal obligation period* and optimize where participants have submitted contingent offers.

For each of the two *seasonal obligation periods*, IESO will accept the most optimal set of offers to minimize the cost of *energy efficiency capacity* procurement while respecting the constraints of the \$2.5M seasonal budget, 13 MW seasonal *maximum capacity limit*, and \$1000/kW *auction price cap*. Further information, including the form of optimization function will be provided during the detailed design. A tie-breaking process will be established during the detailed design to account for a scenario where multiple auction participants submit offers at the same price for the last available quantity.

5.3.1. Auction Price Cap

Similar to the process used historically to set maximum clearing prices in the IESO's Demand Response Auction, the *auction price cap* will be set at 1.25 times the reference price. The reference price will be the historic \$800/kW incentive rate offered for peak demand reductions from custom non-lighting projects through the IESO's flagship Save on Energy Retrofit program for industrial, commercial, and institutional customers. Consequently, the cap will be \$1,000/kW.

5.3.2. Minimum and Maximum Capacity Limits

The minimum and maximum *energy efficiency capacity* the auction will procure for the two obligation periods is 0 MW and 13 MW.

5.3.3. Energy Efficiency Resource Capacity Obligation Limits

As described in Section 3.4 Minimum and Maximum EE Resource Size, limits regarding resource size will be imposed to support achievement of the pilot's learning objectives. No single energy efficiency resource may offer more than the lesser of 3.25 MW of *EE capacity* or a quantity equivalent to \$1.25M divided by the resource's offer price.

6. Pre-Auction Requirements

6.1. PRE-AUCTION PERIOD

To participate in the auction, prospective participants will need to confirm they meet the *pilot auction participant* eligibility criteria, confirm *energy efficiency capacity* with respect to at least one energy efficiency resource, and enter into a standard, non-negotiable agreement committing to deliver their offered *energy efficiency capacity* if successful in the auction.

More specific requirements for confirming *pilot auction participant* eligibility and the form of the agreement will be developed during the detailed design phase and presented to stakeholders for feedback prior to finalization.

6.1.1. Energy Efficiency Capacity Enrollment

For an *energy efficiency resource* to be eligible to compete in the auction, it must first be reviewed and confirmed by the IESO. This process is known as *energy efficiency capacity enrollment*. Potential participants will be required to submit information regarding proposed *energy efficiency resources* in form of a EE resource plan.

The *EE resource plan* enables the IESO to confirm the eligibility of the prospective participants and their resource(s), and assure the viability of measuring and verifying demand reductions from the resources, as well as the feasibility and persistence of the proposed *energy efficiency capacity* contribution. This will support the integrity of the auction process. *Pilot auction participants* will not be required to identify specific *facilities* contributing to a resource during the enrollment process. However, they will need to describe target customer segments if applicable, end uses, *measures*, estimated effective useful life and M&V approach – see 8.4.2 M&V Plan for measurement and verification requirements. Further requirements for the EE resource plan will be defined during the detailed design phase.

After reviewing, the IESO will confirm the maximum quantity of *energy efficiency capacity* that the *pilot auction participants* may offer into the auction from each specific resource for each seasonal obligation period. To manage the risk of underperformance, *pilot auction participants* may select to offer in less than the confirmed *energy efficiency capacity* from a particular resource. The IESO will also confirm the capacity annualization period that will be used to assess the annualized cost of each offered *energy efficiency resource*. This enrollment process will enable the IESO to administer the auction in a consistent, efficient, and transparent manner.

7. Auction Period

7.1. OFFER SUBMISSION AND VALIDATION

During the auction, participants will submit offers using a prescribed Excel template containing the information described in 5.2 Offer Format. The template will be developed in the detailed design. For each offer, the IESO will validate that the offer is from an enrolled energy efficiency resource and that the offered *energy efficiency capacity* and claimed *capacity annualization period* do not exceed what was confirmed during the capacity enrollment process.

7.2. AUCTION CLEARING

Please refer to 5.3 Auction Clearing for high-level information about auction clearing. Further information regarding auction clearing will be provided as part of the detailed design.

7.3. POST AUCTION REPORTING

Once the auction has been cleared, the IESO will publish a public report that includes:

- The amount of *energy efficiency capacity* cleared by each seasonal obligation period
- Number of *pilot auction participants* in each *obligation period*
- Lowest, highest, and weighted average accepted offer price by *obligation period*
- List of *pilot auction participants* that secured *energy efficiency capacity* obligations, including quantity of cleared *energy efficiency capacity* by *obligation period* and high-level description of their *energy efficiency resource* (to be provided by the participant)

8. Forward Period Requirements

A *pilot auction participant* that secures an *energy efficiency capacity* obligation becomes an *energy efficiency capacity provider*.

The period between the auction and the start of an *energy efficiency capacity provider's* first *obligation period* is referred to as the *forward period*. The length of the *forward period* may vary between providers depending on whether they have secured an obligation for both or only one seasonal *obligation period*.

8.1. AUCTION PARTICIPANT AGREEMENT UPDATE

The agreements that *energy efficiency capacity providers* submitted prior to the auction committing to deliver any cleared *energy efficiency capacity* will be updated to reflect the actual quantity of cleared *energy efficiency capacity*, the relevant *energy efficiency resource(s)*, accepted offer price and applicable *obligation periods* (i.e., winter, summer, or both seasons).

8.2. ONLINE IESO REGISTRATION

Energy efficiency capacity providers, who are not already registered market participants or program participants, will be required to register in *Online IESO* as program participants to facilitate settlement of capacity payments.

8.3. ENERGY EFFICIENCY RESOURCE PLAN UPDATE

Energy efficiency capacity providers will be required to provide the IESO with a brief *EE resource plan* update at the approximate midpoint of the forward period, describing the state of resource development and identifying major risks to delivery of their *energy efficiency capacity* obligation. The content required for the EE resource plan update will be defined in the detailed design phase.

The IESO may waive the requirement to submit a *EE resource plan* update when the *energy efficiency capacity provider* has provided an *energy efficiency resource report* as described in 8.4 Energy Efficiency Resource and M&V Plan, before the midpoint of the *forward period*.

8.4. ENERGY EFFICIENCY RESOURCE REPORT AND M&V PLAN

No later than 60 calendar days before their first *obligation period begins*, *EE capacity providers* will be required to submit an *energy efficiency resource report* and *M&V plan* confirming the composition of each *energy efficiency resource* for the *commitment period* and providing information that verifies the feasibility of rigorously measuring energy efficiency capacity delivery.

A process to handle requests to amend the energy efficiency resource report and M&V plan during the commitment period will developed as part of the detailed design phase.

8.4.1. Energy Efficiency Resource Report

This report includes:

- For each *energy efficiency resource*:
 - Unique resource identifier
 - *Energy efficiency capacity* contribution by season
- For each facility constituting an energy efficiency resource:
 - Unique *facility* identifier
 - Physical address of the facility (street, city, province and postal code)
 - Facility type (e.g. residential, commercial, institutional, industrial)
 - LDC name and account number if applicable
 - Description and date of energy efficiency and/or load shifting *measure(s)* installation/implementation
 - Other demand response, energy efficiency or conservation initiatives the facility participates in, including the Industrial Conservation Initiative

The *energy efficiency resource report* will take the form of a prescribed Excel template. The IESO will consider the reports confidential.

8.4.2. M&V Plan

Along with the *energy efficiency resource report*, *energy efficiency capacity providers* will also be required to submit an *M&V plan* in alignment with the *Energy Efficiency Auction Pilot M&V Procedures*. These procedures will be developed in the detail designed phase, building on the *IESO's Evaluation, Measurement and Verification Protocols and Requirements* and the International Performance Measurement and Verification Protocol published by the Efficiency Valuation Organization. The M&V Procedures will include a deemed savings option for certain measures leveraging existing IESO technical references.

Please note however that the IESO will require hourly meter data from each facility within the energy efficiency resource to be provided at the conclusion of the *commitment period* to support evaluation activities.

The IESO will review each *M&V plan* to confirm it aligns with the *EE Auction Pilot M&V Procedures*.

9. Commitment Period Requirements

9.1. ENERGY EFFICIENCY CAPACITY DELIVERY

The *measures* constituting an *energy efficiency resource* must be fully installed/implemented on the first day of the first obligation period or the capacity provider risks non-performance penalties, which is described further in 10. Settlement.

The timing of the seasonal *obligation periods* is described in Section 12. Timelines.

9.1.1. Measurement & Verification (M&V) Reporting

Energy efficiency capacity providers will be required to provide *M&V reports* that align with the approved *M&V plan* for each resource after each *obligation period* during the *commitment period*. These reports enable the IESO to confirm resources are delivering their full *energy efficiency capacity* obligation. *Energy efficiency capacity providers* have up to 60 calendar days after the end of the obligation period to submit M&V reports.

The IESO will review the results of *M&V reports* for settlement purposes within 60 calendar days after they are received.

Energy efficiency capacity providers will be required to retain meter data for each individual facility, and where the facilities are not owned or operated by the *energy efficiency capacity provider*, there must be evidence of an agreement for each facility for IESO evaluation and audit purposes. The IESO may request this information to verify the accuracy of that disclosed by the *energy efficiency capacity provider*.

10. Settlement

As noted above, *energy efficiency resources* must deliver their seasonal *energy efficiency capacity* obligation over the *commitment period*. *Energy efficiency capacity providers* will receive a capacity payment following the completion of each seasonal obligation period for which they have an *energy efficiency capacity* obligation (i.e., a provider with both winter and summer energy efficiency capacity obligations will receive two capacity payments in total, while a provider with an energy efficiency capacity obligation for only one season will receive one capacity payment).

Fully performing *energy efficiency capacity providers* will receive their seasonal capacity payment following completion of each applicable obligation period during the *commitment period*, subject to confirmation of performance through M&V reports.

For clarity, payments will be made on gross (rather than net) demand reduction. The calculation for each capacity payment can be represented as:

$$\text{Capacity payment} = \text{seasonal capacity obligation} \times \text{accepted seasonal offer price}$$

For an example of a resource fully meeting its seasonal energy efficiency capacity obligation, please see Figure 4.

Figure 4: Illustrative example of *energy efficiency capacity* payments to a fully performing *energy efficiency resource*

Obligation period	Accepted offer price	Energy efficiency capacity obligation	Capacity payment
Summer	\$250/kW	400 kW	\$100,000

The IESO will not provide additional payment to *energy efficiency capacity providers* for delivery of capacity in excess of their accepted *energy efficiency capacity* obligation.

10.1. NON-PERFORMANCE PENALTIES

Where the M&V process reveals an *energy efficiency resource* delivered less than its full *energy efficiency capacity* obligation, the IESO will reduce payment for the seasonal obligation period by the difference between the obligated capacity and the delivered capacity, multiplied by twice the resource's accepted offer price. The non-performance penalty calculation is:

$$\text{Non-performance penalty} = (\text{seasonal capacity obligation} - \text{delivered capacity}) \\ \times (2 \times \text{accepted seasonal offer price})$$

Where non-performance penalties are applicable, the calculation of each capacity payment can be represented as:

$$\text{Capacity payment} = (\text{seasonal capacity obligation} \times \text{accepted seasonal offer price}) - \\ ((\text{seasonal capacity obligation} - \text{delivered capacity}) \\ \times (2 \times \text{accepted seasonal offer price}))$$

Please see Figure 5 for an example of a resource that under-delivers during both obligation periods.

Figure 5: Illustrative example of *energy efficiency capacity* payment for an underperforming *energy efficiency resource* with obligations in both seasons

Obligation period	Accepted offer price	Energy efficiency capacity obligation	Year 1 delivered capacity	Difference between obligated and delivered capacity	Year 1 payment
Summer	\$250/kW	400 kW	390 kW	10 kW	\$47,500
Winter	\$250/kW	400 kW	390 kW	10 kW	\$47,500

Under no circumstances will the non-performance penalty for an *obligation period* exceed the capacity payment, had the *energy efficiency resource* fully delivered (i.e., the *energy efficiency capacity provider* will never find itself obliged to pay the IESO) and non-performance penalties will not roll over onto the next *obligation period* (i.e., underperformance during the summer *obligation period* would not impact winter *obligation period* capacity payment if applicable).

11. Relinquishment of Energy Efficiency Capacity Obligation

Mechanisms that enable the buy-out and transfer of capacity obligations, subject to certain conditions, are an existing feature of the IESO's capacity auction designs. In the interests of managing complexity for a limited-scale pilot, the auction will not feature buy-out or *energy efficiency capacity* obligation transfer mechanisms. The *energy efficiency capacity providers* will have the right to relinquish their capacity obligation with written notification to the IESO. The process will be outlined during the detailed design phase.

12. Timelines

The auction will observe the timelines listed in Figure 6 below.

Figure 6: Energy Efficiency Auction Pilot timelines

Period	Responsibility	Activity	Timeline
Pre-auction period	IESO	Post final auction pilot design	April 2020
Pre-auction period	Pilot auction participant	Last date to submit information to verify energy efficiency resource and auction participant eligibility and the agreement	Auction period minus 40 calendar days
Pre-auction period	IESO	Last date to confirm eligibility and communicate capacity and capacity annualization period to auction participants	Auction period minus calendar 10 days
Auction period	Pilot auction participant	Submit offers into auction	September 2020
Auction period	IESO	Clear auction and publish post-auction report	September 2020
Forward period	IESO	Share capacity obligation contracts with successful pilot auction participants	September 2020

Period	Responsibility	Activity	Timeline
Forward period	Energy efficiency capacity provider	Register for Online IESO, if not currently registered	Prior to start of first obligation period
Forward period	Energy efficiency capacity provider	Submit EE resource plan	Forward period midpoint (August 2021 for summer and both season resources, October 2021 for winter resources)
Forward period	Energy efficiency capacity provider	Submit energy efficiency resource report and M&V plan	60 calendar days before first applicable obligation period (April 1, 2022 for summer and both season resources, September 2, 2022 for winter resources)
Forward period	IESO	Review and accept energy efficiency resource report and M&V plan	Energy efficiency resource report and M&V plan submission plus 60 calendar days
Forward period	Energy efficiency capacity provider	Deliver capacity during summer obligation period	June 1, 2022 to August 31, 2022
Forward period	Energy efficiency capacity provider	Last date to submit M&V report	Last day of obligation period plus 60 calendar days

Period	Responsibility	Activity	Timeline
Forward period	IESO	Review and accept M&V report for settlement	M&V report submission plus 60 calendar days
Forward period	Energy efficiency capacity provider	Deliver capacity during winter obligation period	November 1, 2022 to February 28, 2023
Forward period	Energy efficiency capacity provider	Last date to submit M&V report	Last day of obligation period plus 60 calendar days
Forward period	IESO	Review and accept M&V Report for settlement	M&V report submission plus 60 calendar days
Evaluation period	IESO (third- party consultant)	Evaluate energy efficiency resources	TBD
Evaluation period	Energy efficiency capacity provider	Cooperate with IESO's third party evaluation consultant per terms of auction participation agreement	TBD

13. Glossary

The definitions offered in this glossary aim to assist reader comprehension of the mechanisms described in this design document. They do not necessarily reflect the terms set out in the IESO Market Rules, the final terms to be proposed in connection with the Energy Efficiency Auction Pilot, or the IESO’s general interpretation of these terms in relation to other programs or aspects of the Market Rules.

Term	Definition
Aggregator pilot auction participant	A <i>pilot auction participant</i> that offers <i>energy efficiency resources</i> from a portfolio of facilities for which the participant has secured capacity rights, but does not own or operate.
Auction period	The time period from when the IESO opens the window to accept offers from <i>pilot auction participants</i> to when it posts auction results.
Auction price cap	The maximum annualized capacity price at which the IESO will accept offers for <i>energy efficiency capacity</i> in the auction.
Capacity annualization period	A two- to ten-year time period, confirmed by the IESO during the capacity enrollment process, that the IESO will use to determine the annualized capacity cost of an <i>energy efficiency resource</i> offer in clearing the pilot auction.
Commitment period	The time period where an <i>energy efficiency capacity provider</i> is obligated to deliver <i>energy efficiency capacity</i> , beginning on the first day of the provider’s first <i>obligation period</i> .
Demand reduction window	The specific hours during which a resource must deliver demand reductions to meet its <i>energy efficiency capacity</i> obligation. These hours are defined in Section 2.1 The Energy Efficiency Capacity Product.
Distribution system	A system connected to the <i>IESO-controlled grid</i> for distributing electricity at voltages of 50 kV or less and includes any structures, equipment or other thing used for that purpose.

Term	Definition
Energy Efficiency Auction Pilot M&V Procedures	Procedures for measuring and verifying demand reductions from <i>energy efficiency resources</i> for the purposes of assessing performance related to an <i>energy efficiency capacity</i> obligation.
Energy efficiency capacity	Verified demand reduction delivered by <i>energy efficiency resources</i> during the defined time periods stated in Section 2.1 The Energy Efficiency Capacity Product.
Energy efficiency capacity enrollment process	Has the meaning set out in Section 6.1.1 Energy Efficiency Capacity Enrollment Process.
Energy efficiency capacity provider	A <i>pilot auction participant</i> that secures an <i>energy efficiency capacity</i> obligation in the auction and enters into a contract with the IESO to deliver the committed capacity.
Energy efficiency resource	Has the meaning set out in Section 3.1 Energy Efficiency Resource Definition.
Energy efficiency resource report	Has the meaning set out in Section 8.4 Energy Efficiency Resource Report and M&V Plan.
Facility	A building structure – a facility may be located within or upon a building but may also be a structure other than a building, such as a freestanding billboard.
Forward period	The period of time between the end of the auction period and the start of the <i>commitment</i> period.
IESO-controlled grid	Has the meaning set out in the IESO Market Rules.
Individual pilot auction participant	A <i>pilot auction participant</i> who offers resources located at <i>facilities</i> owned and/or operated by the participant.
EE resource plan	A document submitted by <i>pilot auction participants</i> as part of the capacity enrollment process, providing information on planned measures, targeted customers and end uses, marketing strategy, etc.
EE resource plan update	Has the meaning set out in Section 8.3 EE Resource Plan Update.
Maximum capacity limit	The maximum amount of <i>energy efficiency capacity</i> that can be committed for a specific obligation, which signals the point

Term	Definition
	beyond which the IESO is no longer willing to secure additional capacity.
Measure	Has the meaning set out in Section 3.1 Energy Efficiency Resource Definition.
M&V report	Reports submitted by <i>energy efficiency capacity providers</i> upon the conclusion of each seasonal obligation period to confirm delivery of their <i>capacity obligation</i> for settlement purposes.
Obligation period	Has the meaning set out in Section 2.1 The Energy Efficiency Capacity Product.
Online IESO	A web-based registration system for participation in IESO-administered markets and programs.
Pilot auction participant	An incorporated entity that seeks an <i>energy efficiency capacity obligation</i> in the auction pilot, which may be either an <i>aggregator</i> or an <i>individual</i> . <i>Pilot auction participants that secure a capacity obligation in the pilot become energy efficiency capacity providers.</i>
Pre-auction period	The period of time between the final publication of the Energy Efficiency Auction Pilot design and related documents and the <i>auction period</i> .