OCTOBER 21, 2021

Capacity Auction Enhancements

Design Document - December 2022

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Agenda

- December 2022 Capacity Auction Enhancements Recap
- Response to Feedback from August 26 Engagement Session
- Design Document Overview and Updates
  - Outline of Enhancements
- Next Steps

December 2022 Enhancements and Engagement Recap

Recap: December 2022 Auction Enhancements

Enhancement #1: Capacity Qualification	Enhancement #2: Performance Assessment Modifications	Enhancement #3: Expand Participation
• Adopt transparent process methodologies to derive an Unforced Capacity (UCAP) value for all resources while accounting for unique resource participation frameworks	• Changes to performance assessment obligation and assessment framework to incent improved performance from acquired capacity resources	• Increase competition and cost effectiveness through enabling participation from generator-backed capacity imports

Response to Stakeholder Feedback from August 26 Engagement Session

Recap: Recent Written Stakeholder Feedback

- 14 stakeholder feedback submissions received following the August 26th Resource Adequacy engagement webinar
- The following slides summarize some of the key feedback themes relating to the Capacity Auction and provide a corresponding IESO response
- Additional written responses can be found on the Resource Adequacy engagement webpage

Feedback Theme: Performance Assessment Thresholds

Stakeholder Feedback

- Clarification requested as to why Hourly Demand Response (HDR) resources will have a 10% threshold for testing assessments while other resources will have a 5% threshold

IESO Response

- The difference in acceptable thresholds is to account for the different participation models. HDR's contribution is measured using a baseline, which involves some estimations which need to be considered in the assessment that is not applicable for metered generation resources

Feedback Theme: Future De-Rates Using PAF for HDR

Stakeholder Feedback

- Concern that aggregated resources are being de-rated by assets that may not be a part of future portfolio

IESO Response

- The business risk of managing the performance of individual contributors will continue to be the responsibility of the aggregator to manage.
- All resources will need to be qualified using past performance metrics. The IESO believes performance from previous obligation periods to be the most appropriate metric to qualify this resource type

Feedback Theme: Capacity Qualification and Testing

Stakeholder Feedback

- Clarification regarding capacity testing being a qualification step

IESO Response

- At this point, in the Capacity Auction, capacity test activations are not performed as part of the qualification process. Capacity test activations are performed during the obligation period in order to *confirm that a resource's installed capacity (ICAP)*, as cleared in the auction, can be delivered. Results from a capacity test activation will be used for capacity qualification in future auctions.

Feedback Theme: Improving Qualification Outcome

Stakeholder Feedback

- Request to outline the steps a resource could take to improve its de-rated capacity back to the initial value.

IESO Response

- A resource can improve (or remove) their performance adjustment factor (PAF) each year by delivering on their cleared ICAP when tested. If a resource can deliver within the performance threshold (10% for HDR and 5% for all other capacity resources) when tested they will have a PAF of 0 applied for the next applicable auction

Feedback Theme: Second Capacity Test Activation

Stakeholder Feedback

- Clarification on the criteria for requesting a second capacity test activation.

IESO Response

- The IESO will continue with the current practice of conducting up to two tests per obligation period, as required, while accounting for the fact that data submission and assessment timelines may impact the ability to re-test virtual resources. Participants will not have the ability to request a re-test.

Feedback Theme: Availability De-Rating Factor & PAF

Stakeholder Feedback

- Clarification as to why, during capacity qualification, HDR resources will be de-rated by the PAF while other resources will be de-rated by both the PAF and the Availability De-Rating factor.

Feedback Theme: Availability De-Rating Factor & PAF

IESO Response

- For clarification, the PAF is a measure of performance; it is a means of adjusting the resource's installed capacity, if necessary, in accordance with its demonstrated capability during capacity test activation. As discussed previously, the participation model of HDR (standby, etc) means there is a lack of data on which to qualify historic real-time availability. This means that the UCAP for HDRs will need to be based solely on past performance; all other resources will be qualified pursuant to resource-specific methodologies.

Feedback Theme: Availability Assessment True-Up

Stakeholder Feedback

- As part of the Performance Obligation and Assessment Review, the IESO proposed an Availability Assessment 'True-up', which could compensate for some availability charges if, on average over the obligation period, the availability of the resource is determined to be greater than or equal to it obligation amount. The availability of the resource for each hour is capped at the minimum of either 15% above a resource's capacity obligation or its cleared ICAP
- Stakeholders had questions regarding how the 'true-up' calculation would be applied and the rationale for a true up cap.

Feedback Theme: Availability Assessment True-Up

IESO Response

- The availability performance true-up is assessed at the end of the obligation period for each period
- The 15% cap provides a reasonable allowance for a resource to balance out its availability performance charges when, on average, it can make its capacity obligation available in the energy market

Design Document Overview and Recent Design Modifications

Design Document: Purpose and Overview

- Outlines, in greater detail, the intended December 2022 Capacity Auction design enhancements that have been discussed with stakeholders throughout 2021
- Describes the purpose, goals, objectives, implications for participants, and other details of the 2022 enhancements, including how these may interact with other Capacity Auction features
- The document is not intended to provide the a comprehensive overview of the Capacity Auction

Recent Design Modifications

- IESO has continued to advance and refine details of the proposed enhancements in response to stakeholder feedback and internal discussions and these are outlined in the Design Document
- Within the section outlines in the following slides, recent design modifications that have been made following previous stakeholder presentations are highlighted with an asterisk and footnote

Capacity Qualification

Section Outline: Capacity Qualification

- An overview of the capacity qualification process
- General explanation of key capacity qualification concepts
- Qualification inputs and data sources, including how and when these inputs and data sources will be used
- Detailed description of resource-specific UCAP methodologies, including an example calculation for each resource

Capacity Qualification – General Approach

UCAP (MW) = ICAP (MW) x Availability De-Rating Factor x (1 – Performance Adjustment Factor (PAF))

- Where:
  - UCAP is the amount, in MW, that a resource is qualified to offer into the Capacity Auction
  - ICAP is the capability, in MW, as specified by the Market Participant*, reflecting the seasonal generation or load-reduction that a resource is able to provide
  - Availability De-Rating Factor is based on a resource's historical data
  - PAF is the Performance Adjustment Factor, applicable to an individual resource, as based on historical seasonal capacity test activations

*Recent Design Update

Capacity Qualification – Inputs

	ICAP	Availability De-Rating Factor	PAF
Dispatchable Thermal Generation	Seasonal ICAP values provided by Market Participant during capacity qualification process*	$EFOR_d$ value based on 5 years of historical $EFOR_d$ data	For qualification in the December 2023 Auction, PAF will be based on capacity test activation results from summer 2022 and winter 2022/23
Dispatchable Hydro		Production data and scheduled operating reserve data* that coincides with the top 200 hours of highest Ontario demand per season, over the most recent 5 years	
Dispatchable Storage		$EFOR_d$ of 5%	
Dispatchable Load		One year of historical bid data that coincides with the top 200 hours of highest Ontario demand per season	
System Backed Imports		N/A	
Generator Backed Imports		UCAP value in other jurisdiction or same methodology as used for equivalent resource type in Ontario	

*Recent Design Update

Capacity Qualification – Inputs

	ICAP	Availability De-Rating Factor	PAF
HDR	Seasonal ICAP values provided by the Market Participant during the capacity qualification process*	N/A	For qualification in the December 2022 Auction, PAF will be based on capacity test activation results from summer 2021 and a weighted class average of results from winter 2018/19 and 2019/20.* This is because there was no winter 2021/22 obligation period and no testing during the 2020/21 obligation period. Separate class averages will be derived for 1) Physical HDRs, 2) Virtual C&I HDRs, and 3) Residential HDRs.

For all resources: PAFs are based on capacity test activation data from the most recent comparable season for which results are available, using the performance assessment framework that was in place during that obligation period*

*Recent Design Update

Capacity Qualification Data Sources and Time Periods

	December 2022 Auction Year
Qualification Inputs	ICAP for all resources PAF for HDR Historical data as outlined in resource-specific UCAP methodologies Class Average for New Resources
Inputs for Summer PAF Calculation	**HDR:** Resource specific capacity test activation data from summer of auction year 2020 (obligation period May - October 2021) **All other eligible resources:** n/a
Inputs for Winter PAF Calculation	**HDR:** Weighted class average of capacity test activation performance of the HDR fleet from winter obligation periods of auction years 2017 (November 2018 – April 2019) and 2018 (November 2019 – April 2020) **All other eligible resources:** n/a
Auction Outputs	Cleared UCAP: availability performance Cleared ICAP: energy market capability

Capacity Qualification Data Sources and Time Periods

	December 2023 Auction Year
Qualification Inputs	ICAP for all resources PAF for all resources Historical data as outlined in resource-specific UCAP methodologies Class Average for New Resources
Inputs for Summer PAF Calculation	**All resources:** Resource-specific capacity test activation data from summer of auction year 2021 (obligation period May – October 2022)
Inputs for Winter PAF Calculation	**All resources:** Resource-specific capacity test activation data from winter of auction year 2021 (obligation period November 2022 to April 2023)
Auction Outputs	Cleared UCAP: availability performance Cleared ICAP: energy market capability

Performance Assessment Modifications

Section Outline: Performance Assessment Modifications

- Overview of the intent and objectives of the modifications to the performance assessment framework
- A detailed explanation of the six improvements included in the section
- An example of the availability assessment true-up approach
- A summary of changes to settlement charges resulting from the modifications to the Performance Assessment Framework

Summary of Modifications

Level Testing Playing Field	1. **Assess to Capability:** All resources will be assessed to their actual capability when tested, removing the incentive to game assessments by reducing bids 2. **Tighter Performance Thresholds:** Reduce threshold from 20% to 10% for HDR resources for 2022; allow 5% for all other resources. Future changes to thresholds for HDR may be considered pending the results of the HDR baseline methodology review. 3. **Uniform Notification:** Test notices issued to all participants a day ahead of the scheduled test; test details would continue to be provided pursuant to scheduling timelines
Incenting Performance	4. **Performance De-rates:** If a resource fails a test, in addition to current charges, their value in the subsequent auction will be de-rated in the following year as part of qualification 5. **Higher Charges at Times of Need:** Levy of 2x Capacity Charge (2 months of payments) for poor performance during Emergency Operating State Control Actions (EOSCA) activations
Fairness in Assessments	6. **Move to seasonal average availability assessment:** by allowing resources to receive a credit where their availability exceeded their UCAP value to complement the current availability charge. Ensures alignment between different processes (qualification and availability).

Generator-Backed Capacity Imports

Section Outline: Generator-Backed Capacity Imports

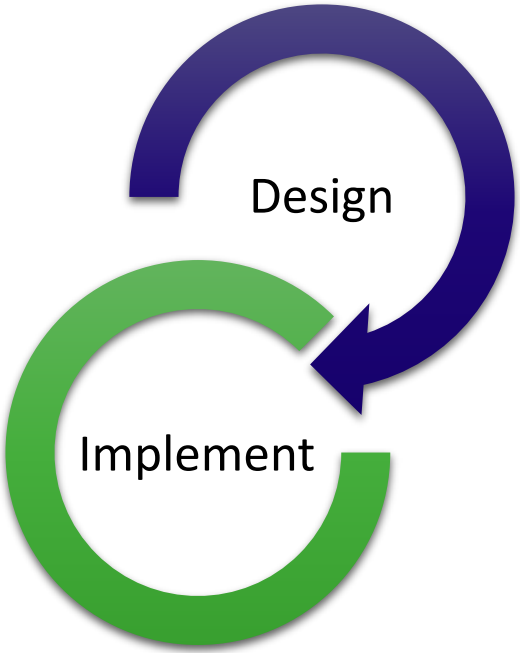
- General overview of the proposal to expand Capacity Auction participation to include Generator-backed Capacity Imports
- Participation model details including:
  - Eligibility requirements
  - Pre-auction, forward period, and obligation period requirements and obligations
  - Performance assessment details including outage and data submission requirements
- Details of operating agreements with neighbouring jurisdictions

Update on Neighbouring Jurisdictions

- Over the course of 2021, the IESO has had a series of discussions with neighbouring jurisdictions regarding capacity trade
- Based on these discussions, and pending finalization of operational agreements, the IESO expects to be able to facilitate generator-backed capacity imports from NY and Quebec for the 2022 Auction
- IESO plans to continue discussions with MISO but does not expect to have agreements in place for the 2022 Auction

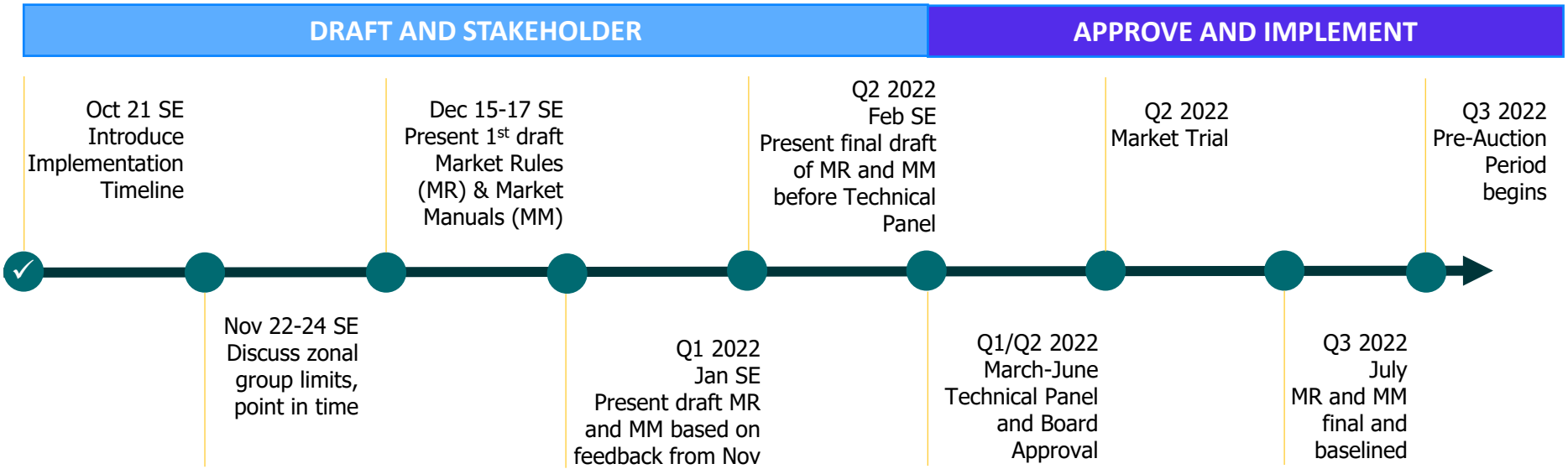
Capacity Auction Enhancements – from Design to Implementation

From Design to Implementation



- Starting from October and for the next several months, the emphasis of consultation for the 2022 Capacity Auction will move from discussion of design toward details related to the *implementation* of enhancements
- Discussions will include Market Rule, Market Manual and process changes required to implement enhancements

Capacity Auction Implementation Timeline



Future Design Enhancements

- IESO will work with stakeholders to identify future auction enhancements for consideration and how best to prioritize this work
- Further discussion on future enhancement priorities will take place in Q4 2021

Next Steps

- Stakeholders are invited to submit questions and comments on the design document to engagement@ieso.ca by **November 12, 2021**
- IESO will review feedback and respond to any clarifications and will publish final design document in Q4 2021, along with proposed market rule and market manual amendments to enact the enhancements

Thank You

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Appendix

Calculation of Class Averages

- For any new resources for which a resource-specific qualified capacity cannot be derived, the IESO will qualify these resources as follows
- For HDR Resources
  - Weighted Average of Seasonal Test Activation Performance of HDR Fleet
- For all other resources
  - Fleet simple average of the availability de-rating factor specific to the resource type

Winter 2022/23 PAF for HDR Resources

- No test activation event occurred during the winter 2020/21 obligation period as no capacity was procured for that obligation period
- In order to qualify HDR resources for the 2022/23 winter obligation period, the IESO will employ the weighted average methodology to determine the PAF
- The PAF for the winter 2022/23 obligation period will be **0 (zero)**

Methodology for winter 2022/23 PAF for HDR resources

- IESO utilized the weighted average approach using the data available from the test activations during the winter 2018/19 and winter 2019/20 obligation periods to determine the winter 2022/23 PAF
- The weights were assigned relative to the resource with the largest capacity obligation (in MWs) in that obligation period; not to the total MW amount of the HDR fleet in that obligation period
- The de-rating factor for an individual resource was calculated by taking a ratio of the average MW quantity delivered over the four hours (HE 17 to HE 20) to the average bid quantity for the same time period

Methodology for winter 2022/23 PAF for HDR resources

- A weighted average is calculated by:
  1. Multiplying the individual PAF calculated for each resource by its assigned weight
  2. Taking an average of all PAFs for the entire fleet.
- Averages were calculated for both 2018/19 and 2019/20 winter obligation periods and then a final de-rating factor was calculated by taking an average of the de-rating factor for winter 2018/19 and winter 2019/20 obligation period
- Using the methodology discussed, the final class average de-rating factor calculated for the winter 2022/23 obligation period is **0 (zero)**