DECEMBER 7, 2021

Medium-Term RFP & Capacity Contract Webinar

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Agenda

- Capacity Qualification Process Overview
- Availability Non-Performance and Planned Maintenance
- Events of Default by the Supplier
- Reserve Price Overview
- Frequently Asked Questions and Feedback
- Questions and Discussion
- Next Steps

Purpose

The purpose of today's meeting is to address and respond to some of the key questions submitted to the MT.RFP@ieso.ca inbox and feedback received during the November 25, 2021 webinar.

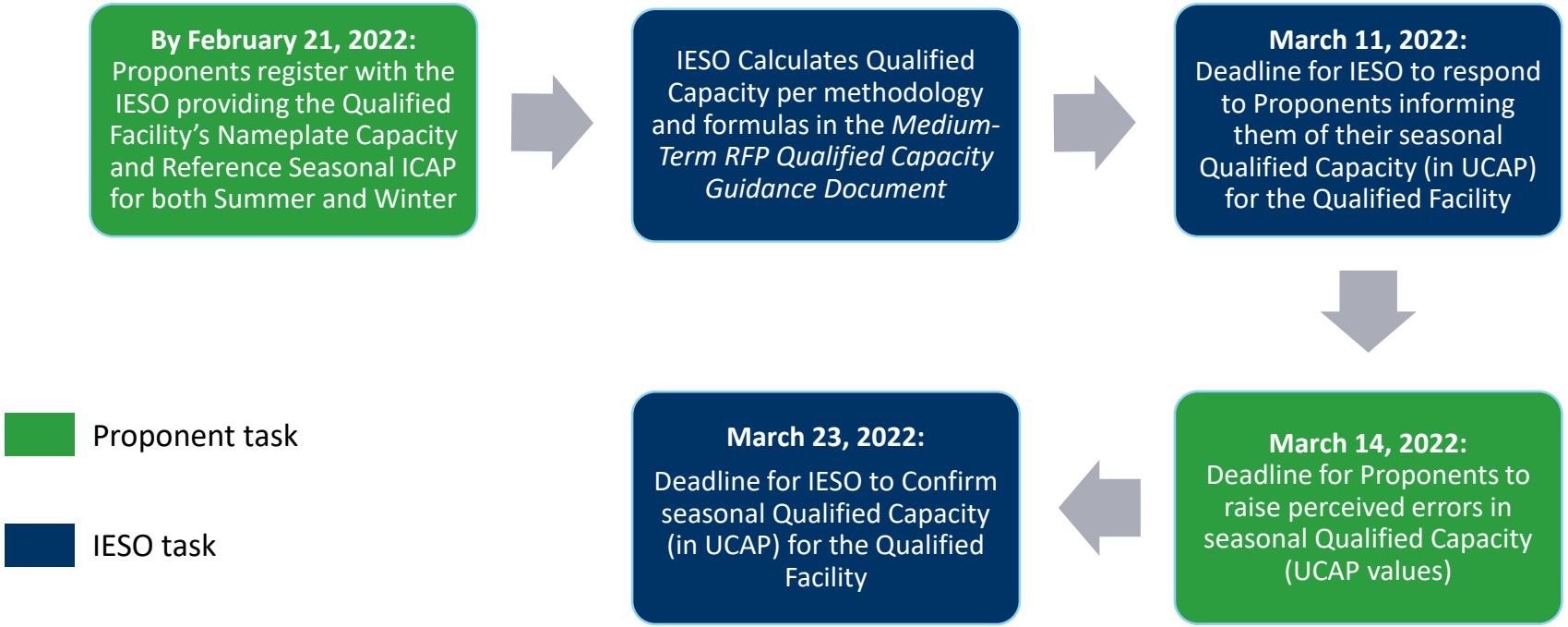
In addition, the IESO encourages participants to ask additional questions and provide any feedback during the open discussion portion of the webinar.

Capacity Qualification Process Overview

Capacity Qualification Process

- Proponents will be required to submit their reference seasonal Installed Capacity (ICAP) values for their facilities as part of the MT RFP registration process
- Based on the ICAP submitted by the Proponent, the IESO will determine the seasonal Qualified Capacity (in UCAP) for the Qualified Facility.
- Proponents will have an opportunity to flag any perceived errors in their seasonal UCAP values to the IESO prior to the finalization of their Qualified Capacity

Capacity Qualification Process (2)



Selecting a Reference Seasonal ICAP

- Proponents will be responsible for selecting Reference Seasonal ICAP values for individual Qualified Facilities and providing them to the IESO during registration
- Reference Seasonal ICAP values may be based on the maximum expected offer/bid capability of a facility given optimal operating conditions (i.e., ambient temperature, etc.)
- Proponents are reminded that Capacity Check Tests and Pre-Term Capacity Verification will be completed on the basis of 100% of a Qualified Facility's Reference Seasonal ICAP; therefore taking a more conservative approach to ICAP selection may be warranted
- Similarly, since Qualified Capacity, and therefore Monthly Minimum Offer Quantities/Minimum Capacity Factors, are derived from Reference Seasonal ICAP values, any Non-Performance Charges will be based on those quantities

Capacity Qualification Calculation

- Qualified facilities will be provided with seasonal UCAP values based on the formula below:

$$UCAP\ (MW) = ICAP\ (MW) \times Availability\ De\text{-}Rating\ Factor$$

- 5 years of historical data will be used to calculate the availability de-rating factor, based on one of the following criteria: equivalent forced outage rate on demand (EFORd), or production data from the top 200 hours of Ontario demand (per season)

Capacity Qualification – Example 1

UCAP calculation for Must-Offer thermal generator:

- For Must-Offer thermal generators, their Availability De-Rating Factor is based on their Equivalent Forced Outage Rate on Demand (EFORd) derived from 5 years of historical EFORd data
- A Must-Offer thermal generator with a 100 MW ICAP value and an 8% EFORd value would have the following UCAP calculation:

UCAP = ICAP x Availability De-Rating Factor
= ICAP x (1-EFORd)
= 100 MW x (1-8%)
= 100 MW x 0.92
= 92 MW

Capacity Qualification – Example 2

UCAP calculation for Must-Offer storage:

- Must-Offer storage ICAP value is based on the lesser of Full Power Operating Mode, or the Energy Rating divided over four (4) hours
- For Must-Offer storage, their Availability De-Rating Factor is based on their EFORd value which is set at 5%
- A Must-Offer storage facility with an 8 MW Full Power Operating Mode value, 16 MWh Energy Rating, and a 5% EFORd value would have the following UCAP calculation:

UCAP = [min(Full Power Operating Mode, Energy Rating/4 hours)] x (1-EFORd)
= [min(8MW, 16MWh/4h)] x (1-5%)
= [min(8MW, 4MW)] x 0.95
= 4MW x 0.95
= 3.8MW

Capacity Qualification – Example 3

UCAP calculation for FCF variable generation (wind):

- For FCF variable generation (wind), their Availability De-Rating Factor is based on AQEI and foregone energy or simulated data that coincides with the top 200 hours of highest Ontario demand per season, over the most recent 5 years on a zonal fleet wide basis
- An FCF VG (wind) facility with a 95 MW ICAP value, Maximum Active Power Capability of 100 MW and a 30 MW Median of [Zonal total AQEI (MWh) + Zonal total foregone energy of the fleet (MWh)] value would have the following UCAP calculation:

UCAP = ICAP x [(Median of [Zonal total AQEI (MWh) + Zonal total foregone energy of the fleet (MWh)] in Top 200 hours of Ontario demand per season for the last 5 years) /Maximum Active Power Capability (MW)]
= 95MW x (30MW/100MW)
= 95MW x 0.3
= 28.5 MW

Availability Non-Performance and Planned Maintenance

Availability Non-Performance Charges

- If in any given settlement month a Facility's Monthly Average Offered Quantity or Facility Capacity Factor is **less** than the Monthly Minimum Offer Quantity or Minimum Capacity Factor, an Availability Non-Performance Charge will be assessed and charged
- The following slides contain simplified examples of Availability Non-Performance Charge calculations for illustrative purposes. The values for outage hours and average quantities have been selected arbitrarily. Stakeholders are encouraged to review the draft Medium-Term Capacity Contract for detailed equations and terms.

Availability Non-Performance Charges (2)

Monthly non-performance factors are set out in the table below:

Month	Factor	Month	Factor
January	2.0	July	2.0
February	2.0	August	2.0
March	1.5	September	2.0
April	1.0	October	1.0
May	1.0	November	1.0
June	1.5	December	1.5

The non-performance factors are based on those developed for the Capacity Auction (CA), as referenced in table 6-1 of Market Manual 12.

Example 1 – Must-Offer Facility

A Must-Offer Facility ("Facility A") with a **September** Monthly Contract Capacity of **50 MW** and a **Fixed Capacity Payment** of **$300/MW-Business Day.**

- During the settlement month of **September**, the Facility had 0 Planned Outage Hours and 0 Force Majeure Outage Hours. Therefore, the Monthly Minimum Offer Quantity for Facility A is **47.5 MW**.
- Looking at Facility A's offers in September, the Monthly Average Offered Quantity was **45 MW**; below the Monthly Minimum Offer Quantity
- The resulting Availability Non-Performance Charge would be **$34,736.84**

  Availability Non-Performance Charge = Monthly Capacity Payment ($/Settlement Month) x Shortfall of the Monthly Average Offered Quantity below the Monthly Minimum Offer Quantity x Monthly Non-Performance Factor

  $34,736.84 = ($300 x 50 MW x 22 Business Days) x ((47.5-45)/47.5) x 2

Example 2 – Must-Offer Facility Planned Maintenance

Facility A has identified the current settlement month, October (50 MW Monthly Contract Capacity) as its Annual Planned Maintenance Month. As such Facility A has taken a total number of 160 Planned Outage Hours.

- Based on those Planned Outage Hours and the Planned Outage Capacity Reduction Factor, the Monthly Minimum Offer Quantity for Facility A is **25.91 MW = 0.95 (50 x 0.545)**
- Looking at Facility A's offers in October, the Monthly Average Offered Quantity was **26 MW**; above the Monthly Minimum Offer Quantity
- Therefore, in this case there would be no Availability Non-Performance Charge, rather the impact of the Planned Outage is that it reduces the Monthly Minimum Offer Quantity

Events of Default by the Supplier

Events of Default by the Supplier

What protections are there for an FCF Facility to avoid an event of default if they are not available due to unforeseeable weather patterns?

- Force Majeure provisions in Article 11.3 speak to specific extreme weather events that would reduce a Supplier's obligations
- Absent a claim of Force Majeure, an event of default for an FCF facility will occur only if rolling 3-month period during any Season is less than 90% of the Minimum Capacity Factor. This is an incremental discount factor, that is in addition to the discount applied at deriving the minimum capacity factor as per schedule E-B of the MT Capacity Contract

Events of Default – Historical Wind Data Analysis

- The IESO examined actual hourly production capability data from 2019, 2020 and 2021 for five transmission connected wind facilities (delivered + forgone energy)
- Monthly and 3-month rolling average capacity factors were calculated based on these data and compared against the Minimum Facility Capacity Factors for the same periods dictated by the performance obligations set out in the draft contract

Events of Default – Historical Wind Data Analysis (2)

- **Four instances of Monthly Non-Performance charges** would have been incurred over the entire period, affecting two facilities (two Monthly Non-Performance charges each)
- **No events of default** would have been triggered for any of these facilities in the time period examined under the proposed compliance obligations
- On average the 3-month rolling capacity factors were **2.6x** higher than the 3-month Minimum Facility Capacity Factors

Reserve Price Overview

Reserve Price

How was the Reserve Price derived?

- The Reserve Price for the MT RFP was developed through consideration of a number of factors and data points, including past Capacity Auction clearing prices in Ontario and other jurisdictions, the attributes of eligible resources and term length

Is the Reserve Price applicable for the whole period?

- Yes, the Reserve Price is applicable over the entire term of the MT Capacity Contract

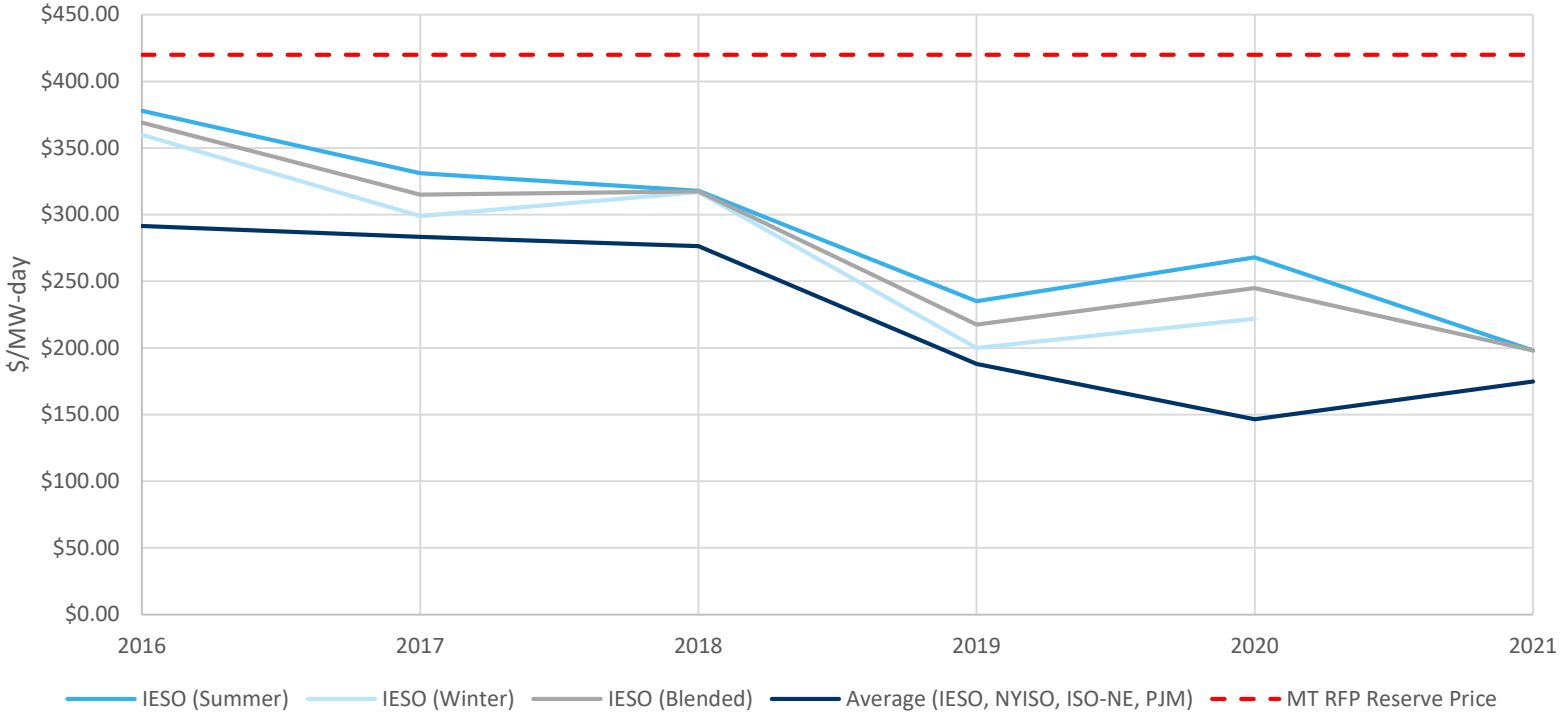
Determination of the Reserve Price Value

The Reserve Price of $\$420/MW_{UCAP}\text{-}day_{Business}$ was determined based on internal analysis and the recommendation of third-party technical consultants.

Key considerations:

1. Estimation of costs to operate a generation asset nearing the end of its service life, informed by the costs of a new comparable generation asset; and
2. Review and analysis of regional capacity auction results for both short- and medium-term commitments (IESO, NYISO, ISO-NE, PJM)

Regional Average Capacity Clearing Prices



Reserve Price Rationale

- Only existing facilities that have reached the end of their existing contract terms are eligible to participate in the MT RFP. Based on the intent of those contracts, the IESO assumes that facilities have been able to recover construction and the majority of capital costs through existing contracts. As such the IESO has set the Reserve Price below the Net CONE of an ideal capacity product to protect the interests of ratepayers
- Throughout the Resource Adequacy engagement, the IESO has heard from stakeholders that a longer term length provides additional certainty and thus more competitive pricing
- With the additional 2 years added to the MT RFP term, the IESO believes that a Reserve Price below the Maximum Auction Clearing Price is warranted

Frequently Asked Questions and Feedback

Eligibility

Are behind-the-meter facilities eligible for the MT RFP?

- No, only the portion of the nameplate capacity of such Qualified Facility that is directly connected to the IESO-controlled grid or to a distribution system and that is not otherwise physically or contractually committed to a host facility or other party is eligible to participate in this Medium-Term RFP

Eligibility (2)

Are uprates to existing facilities eligible for the MT RFP?

- Uprates to eligible facilities under the MT RFP are eligible for the MT RFP
- However, all permits and connection agreements for the facility must be in place at the time of the proposal submission. Any increases in capacity or changes to technology relative to a facility's prior history must either already be completed or must be allowed under the existing terms and conditions of the facility's regulatory permits and connection agreement as of the time of the proposal submission.

Capacity Qualification – Uprates

How will Qualified Capacity be calculated for uprates to existing facilities?

- As part of the registration/capacity qualification process, Proponents must provide their Seasonal Reference ICAP values to the IESO
- This value should include any uprates that meet the requirements in the MT RFP

Outages

Do external outage factors provide Facilities with relief?

- Article 11.3 of the draft contract defines Force Majeure in the context of the agreement and provides a number of examples
- In addition, 11.3(i) speaks to unanticipated maintenance or outage affecting the Facility including requirements to notify the IESO
- For clarity, when applicable the Force Majeure Capacity Reduction factor for a given settlement month reduces the Adjusted Monthly Contract Capacity and thus the Minimum Offer Quantity/Minimum Capacity Factor
- The same Force Majeure Capacity Reduction Factor will be applied to reduce the calculation of the Monthly Payment

Planned Maintenance Months and Hydro

Will there be any flexibility in the planned maintenance months for hydro facilities to account for freshet?

- Thank you for drawing the IESO's attention to this specific issue
- With the announcement of the potential program for re-contracting small hydroelectric facilities in the November 10, 2021, letter from the Minister of Energy, the IESO would like to continue this discussion in the context of the LT RFP design and broader discussions around future acquisition mechanisms

Environmental Attributes

What is the intent of the Environmental Attribute provisions in the MT Capacity Contract?

- The IESO will correct a residual reference in the MT Capacity Contract that refers to transferring Environmental Attributes to the buyer, that was identified in the November 25th webinar
- To clarify, the Environmental Attribute provisions permit Suppliers to retain all revenue opportunities associated with the Environmental Attributes in relation to the product of the contract

Interdependencies with MRP

How will market based requirements under MRP affect the performance operations and obligations of MT suppliers?

- The IESO recognizes that there is always future risk in any acquisition mechanism and this risk needs to be split between the procuring authority and the proponent. The design of the MT Capacity Contract attempts to strike this balance, while relying on the post-MRP market design (i.e., the Day-Ahead Market) to drive efficient outcomes.
- Proponents have raised concerns about their ability to forecast post-MRP market revenues, and the IESO recognizes these concerns

Interdependencies with MRP (2)

- While the IESO does not have the modelling capability to model all potential outcomes from MRP, Proponents are reminded that currently available Shadow Prices are the best available proxy for future locational marginal prices
- Additionally, Proponents are encouraged to review the MRP Detailed Design, and the current and forthcoming Market Rules and Manuals, to be able to determine their strategy for participating in the new market
- If there are specific provisions that would cause undue risks to Proponents, we invite stakeholders to identify them so that the IESO can investigate further

Confidentiality

Will the IESO publish the prices for each successful participant in the MT RFP?

- The IESO will seek to provide some price transparency after contract award while ensuring commercial confidentiality is maintained

Procurement Target

What is the criteria by which the IESO will assess whether the target capacity ought to be adjusted to ensure competition?

- The Registration stage will provide the IESO with an early indication of the level of competition it can expect ahead of finalization of the RFP
- Based on the volume of registration, the IESO may adjust the Target Capacity accordingly in order to ensure competition

Additional Questions?

Next Steps

- Stakeholders are invited to submit questions and feedback regarding the MT RFP and Capacity Contract to MT.RFP@ieso.ca.
- The IESO will be receiving any questions or feedback on the draft RFP and draft contract until **December 10, 2021.**
- The Final Medium-Term RFP and Capacity Contract will be posted for **January 31, 2022.**
- A Question and Comment period will follow from posting until **February 14, 2022.**

Thank You

ieso.ca

1.888.448.7777

customer.relations@ieso.ca

MT.RFP@ieso.ca

@IESO_Tweets

linkedin.com/company/IESO

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