

# Enabling Capacity Exports: Detailed Design and Project Update

Stakeholder Engagement Meeting

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April 16, 2018

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# Agenda

- Capacity Export Project Review
- Capacity Exports Design
- Next Steps

# Capacity Export Project Review

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# Enabling Capacity Exports Project Overview

- Projections are that Ontario will have sufficient capacity to meet or exceed reliability planning needs in most periods until the early/mid 2020's
- Neighbouring or nearby jurisdictions have some method of securing capacity (i.e., auctions and/or contracting) which can include imports
- Creates an enduring framework for Ontario-based resources to export capacity

# Capacity Export Project Overview

- The Enabling Capacity Exports project will create an enduring framework to enable Ontario based resources to export their capacity while ensuring that Ontario continues to meet planned reliability needs
- Enabling capacity exports:

Provides Ontario based resources an opportunity to monetize capacity not required for Ontario planned adequacy during certain periods

Offers an alternative to facilities that may otherwise choose to idle or shut down due to Ontario market conditions

Improves the efficient utilisation of assets regionally

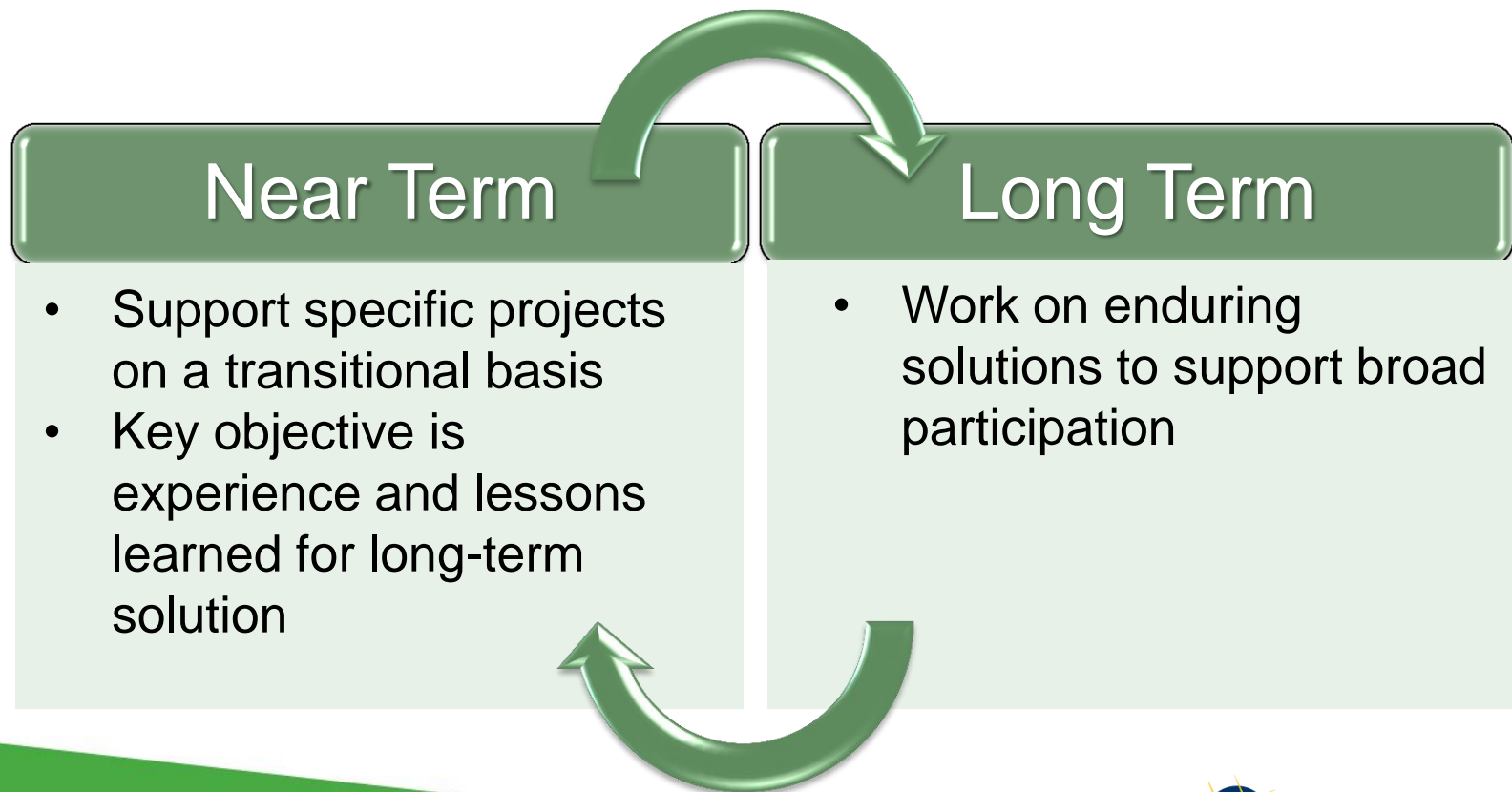
# Capacity Exports and Market Renewal

*Market Renewal consists of two distinct work streams:*

Work Stream	Primary Objective	Initiatives
<b>Energy</b>	<b>Reduce cost and gain efficiency</b> of scheduling energy to meet provincial demand	<ul style="list-style-type: none"><li>• Single Schedule Market</li><li>• Day-Ahead Market</li><li>• Enhanced Real-Time Unit Commitment</li></ul>
<b>Capacity</b>	<b>Reduce cost</b> of procuring incremental resources alongside contracted/regulated assets	<ul style="list-style-type: none"><li>• Capacity Trade (imports and post-MRP exports)</li><li>• Incremental Capacity Auction</li></ul>

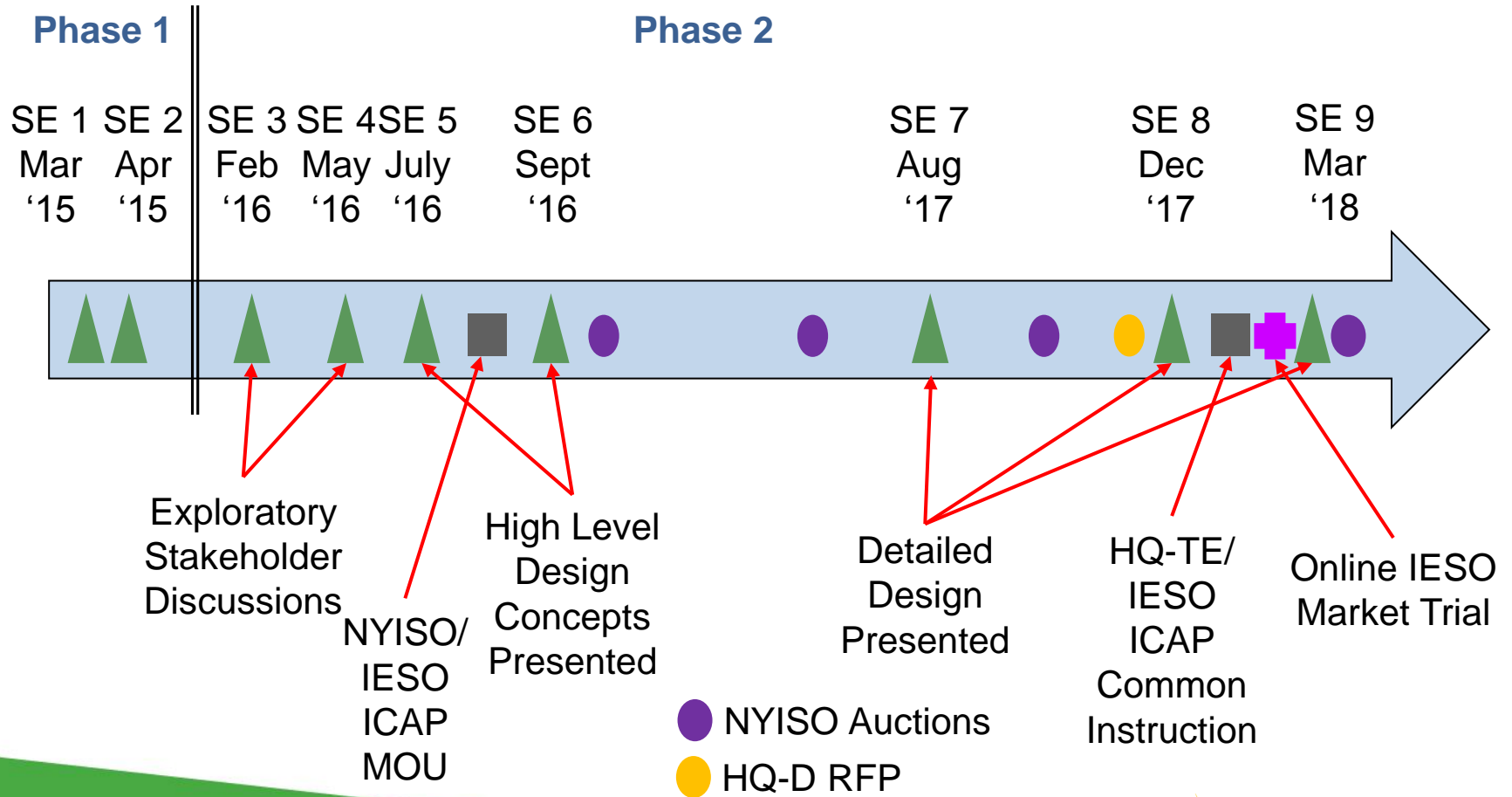
# General Development Approach Followed

In the development of capacity exports, the IESO has followed a process of supporting near term projects while developing the enduring solution





# Capacity Exports Project to Date



# Phased Implementation

	Phase		
	2	3	4
Timing	2017 and 2018	2019 or later	With MRP Implementation
Export Markets Enabled	New York, Quebec	MISO, PJM (TBD)	NA
Capacity Export Request Review Process	Pre-MRP implementation processes set	Same as Phase 2; Multi-year and forward commitments investigated	TBD based on requirements/opportunities created by MRP implementation
Settlements	Pre-MRP implementation processes set	Same as Phase 2	TBD

# Capacity Exports Design

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# Capacity Export Design Principles

- In developing capacity exports, the following general principles have been followed:
  - Maintaining Ontario reliability was prioritized
  - Alignment with neighbouring jurisdictions
  - Capacity resources should be reasonably expected to be able to support capacity calls
  - Limitation of market costs imposed through congestion

# High Level Processes



# Eligible Resources

- Eligible resources for this phase of implementation include all Ontario-based generation resources except variable generators
  - Demand Response and storage are not currently supported

# Capacity Export Request Submission

- Both auction and contract-related capacity export requests will be submitted via Online IESO
- Submission must be by an Equipment Registration Specialist with rights to submit on behalf of the proposed Capacity Resource

## Via Online IESO

- Resource that will be exported
- Quantity of capacity
- Destination jurisdiction and counterparty
- Commitment period
- Closing date (for contracts)
- Whether the MP is willing to accept a partial approval

## Direct Submission

- Processing cost recovery deposit/fee (if instituted)

# Resource to be Exported

- The total installed capacity that the MP wants to export by resource
  - Request conforms to how the resource is registered
    - Can be an individual generator or an aggregate of two or more generators if they are registered as a single resource with the IESO
    - Portfolio submissions will not be supported due to the impact on adequacy assessments



# Destination and Counterparty

- To which jurisdiction is the capacity to be committed?
  - Currently NYISO and HQ are enabled
- Who is the buyer (i.e., the counterparty)?
  - If an auction, it's the ISO running the auction
  - If a contract, it's the buyer, such as a Load Serving Entity
- Why do we need to know this?
  - Capacity can only be committed externally where the associated energy will be called by the responsible external system operator due to a shortfall in Operating Reserve or Energy
  - Request will be denied if the counterparty does not have the ability/willingness to comply with this requirement

# Commitment Period

- Commitment Period
  - Start and end date of the period during which the capacity will be unavailable to Ontario (i.e., committed to the other jurisdiction)
  - Cannot start more than six months from the date of request submission
  - Can be for as little as one month
  - Cannot exceed one year

# Willingness to Accept a Partial Approval

- IESO may determine that the request can only be approved for fewer MW or for fewer months than submitted
- The MP can indicate if they would want to accept a partial approval
  - If not, the request will be approved in full or not at all

# Cost-Recovery Deposit/Fee

- Reviewing capacity export requests can involve significant effort
- A cost-recovery deposit/fee is being considered

# IESO Reviews

Congestion Screen	Is the resource in an historically congested area?
Unit Planned Outage	Will the resource be able to support a Capacity Call most of the time?
Local Transmission Outage	Will the resource be able to support a Capacity Call most of the time?
Intertie Capability Check	Can the interties transmit the sum of all capacity exports?
Contract Review	Any contract related issues?
Resource Adequacy Assessment	Can adequacy be maintained on a planned basis?
Congestion Study	What is the projected congestion on the path to the border?

# Congestion Screen

- Congestion increases costs to the market
  - These costs are paid by all consumers through CMSC uplift
- An initial congestion screen will be conducted to determine if the resource is in an historically congested area
- The screen will involve an analysis of historical unconstrained schedules versus the system operating limit of the first major internal interface between the resource and the export zone
- Request will be denied if the major interface is found to have been congested more than 5% of the time during peak hours (HE 7 to HE22 on weekdays) of the same months of the year as in the capacity export request over the last five years
  - The 5% limit is consistent with limits used to determine allowable connection sites for past resource procurements

# Unit Planned Outage/Local Tx Outage

- IESO will check
  - If planned outages exist for the resource
  - If planned local transmission outages would restrict the resource from the broader grid
- If planned outages exist cumulatively for greater than 5% of peak hours (HE7 to HE22 on weekdays) during the proposed commitment period for both checks combined, the request will be denied or reduced in MW (if the resource is derated), or approved for a shorter duration (e.g., for only 4 months of a 6 month request)

# Intertie Capability Test

- The IESO must be able to transmit the sum of all capacity export commitments simultaneously to buying markets
- Need to ensure that the total MW committed externally do not exceed the reasonably projected ability of the system to transfer the associated energy to the buyer's jurisdiction when required
- If so, export requests may be denied or only partially approved



# Intertie Capability Test

- Calculations for all interties will include a reduction to the all-in-service transmission limit based on the greater of the reduction resulting from:
  - Assuming that one critical element is out of service, *OR*
  - The total of all known overlapping outages during the proposed commitment period as long as this lower limit is in effect cumulatively for more than 5% of peak hours
- The exportable capacity limit for Quebec will also consider the need to support local reliability in the Ottawa area given transmission restrictions

# IESO Contract Review

- If the requested resource is under an IESO contract it will be determined if there are:
  - Any contract-related issues that would preclude participation
  - Other issues which need discussion/resolution
- All such discussions will be between the resource owner and the resource's Contract Manager at the IESO

# Resource Adequacy Assessment

- This review will determine if resource adequacy planning requirements can be expected to be satisfied over the proposed commitment period without the subject capacity
- Done using the Firm Resource/Extreme Weather scenario from the 18-Month Outlook
- The capacity export request will be evaluated by considering the proposed Reserve Above Requirement (RAR) during the commitment period
  - RAR is the difference between available resources and required resources
    - Required resources are expected demand plus a reserve amount

# Resource Adequacy Assessment

- The evaluation will consider any already approved capacity export requests that are for the same period
- Planned outages will not be modified to influence approval (i.e., by affecting the supply/demand balance)
- MPs can't use replacement energy offers to support an outage so as to modify overall supply

# Resource Adequacy Assessment

- If multiple submissions come in for the same capacity opportunity
  - Resource adequacy will be assessed using the lesser of
    - the total amount of capacity that MPs want to export; and
    - the maximum amount of capacity that the other jurisdiction will allow to be exported to them
  - Approvals will be based on date/time stamp order

# Resource Adequacy Assessment

- As stated, the evaluation will use the 18-Month Outlook methodology using the Firm Resource/Extreme Weather scenario
- This same scenario is proposed to be used for planned outage approvals in the near future
  - The outage process will assume this scenario, but will also assume that up to 2000MW of imports are available in real time. If this number is assumed, outages will be approved if the projected RAR in the scenario during the outage period is -2,000MW or higher

# Resource Adequacy Assessment

- Because of the importance of being able to accommodate planned outages in terms of system reliability and costs to the market, capacity exports will be evaluated assuming that fewer imports are available in order to prioritize outages
  - Currently assumed to be 1200 MW for up to 6 month commitments. That is, resources considered 'firm' will be authorized to export if the RAR is at -1200MW or higher
  - A lower import assumption will be used for longer commitments up to 12 months to take into consideration the greater uncertainty about outage submissions over a longer period

# Congestion Study

- A study to determine the projected degree of congestion between the resource and the external jurisdiction will be conducted
- It can involve two reviews:
  - Power System Analysis to identify possible congestion under stressed conditions
  - Production System Study to further analyze congestion
- If the PSS projects congestion to exist on the path from the resource to the external jurisdiction in more than 5% the proposed commitment period, the capacity export request will be reduced or denied



# Approval/Denial of a Capacity Export Request

## Fully Approved

Request passes all reviews with no reduction required in the MW or commitment period

## Partially Approved

MP accepts partial approval and is only approved for a reduced quantity of MW and/or commitment period

## Denied

Request is denied if any of the reviews are not passed and/or it partially passes but MP does not accept partial approval

# MPs Request Reconsideration

- MPs can ask for a reconsideration of a decision concerning their capacity export request, but must provide a reason why, which can include:
  - Changed global energy supply and/or demand forecasts over the proposed Commitment Period that would change the outcome of the Resource Adequacy Assessment
  - Changed planned resource or transmission outages that would allow the Capacity export request to now pass reviews
- The IESO will reconsider on a best efforts basis

# Revoking an Approved Request

- If required to maintain Ontario adequacy or security, or if the IESO becomes aware of any event of circumstance that would alter approval, an approved capacity export request can be revoked up to and including the day before the auction, RFP deadline or the day the participant expects to sign a contract

# Submitting Commitment Information

- If the MP is successful in securing an external capacity commitment based on an approved capacity export request, they will submit information to the IESO so that the commitment can be recorded and administered
- Using Online IESO, MPs will submit commitment information:
  - Within three business days following the result publication date of an annual, NYISO six month Strip or Monthly auction;
  - Within three business days following the entered Closing Date of a capacity contract; or
  - By noon the day after NYISO Spot auction results are posted

# Outages

- Buying jurisdictions need to be made aware by the MP of outages to Capacity Resource(s) or transmission elements which render such resources grid incapable
- If allowing an outage would result in a reliability concern for the buying jurisdiction, they may:
  - Deny a Capacity Resource outage before it can be submitted to the IESO (as IESO outage submission and review processes and timelines will not change), or
  - Request that a Capacity Resource ask a transmitter to cancel or reschedule a planned outage that would make the resource grid incapable:
    - If such an agreement cannot be arranged, the Capacity Resource can ask that the IESO to resolve

# Capacity Calls

- If an external jurisdiction is experiencing or anticipates experiencing an operating reserve or energy shortfall, it can require Ontario resources that committed capacity to their jurisdiction to export energy to that jurisdiction for a specific period of time
  - This is referred to as ‘calling’ the energy
- Calls can occur day-ahead up to 135 minutes before the dispatch hour
  - That is up to 15 minutes before the start of the mandatory window
  - The mandatory window will not be opened

# Capacity Calls

- No later than 125 minutes to the dispatch hour, the participant designated to submit energy exports must enter
  - An energy export bid to the calling jurisdiction
  - For the MW called
  - Bid at \$2000
  - For the duration of the call
  - With “ICAP” in the NERC tag ID
  - With the 6 digit resource ID of the Capacity Resource in the “Other Reason” field

# Capacity Calls

- The participant must also call the IESO Control Room and provide details of the call as soon as they have submitted their export bid
- They must also adjust any operating reserve (OR) offers to make sure that they can manage both an OR activation and the Capacity Call
- If there are any changes to the call (e.g., duration or quantity), the participant is also to call the IESO Control Room
- If the processes are followed, the IESO will not curtail the Called Capacity Export except under certain circumstances



# Curtailment

- Called capacity exports can be curtailed to:
  - Prevent violation of a voltage, stability or thermal transmission limit
  - Prevent a threat to the safety of any person, damage to equipment, the environment or the violation of any applicable law
  - Match the schedule or output of the associated generator if Ontario suffers or anticipates suffering an energy or operating reserve shortfall
  - If there is a market suspension or a market tool failure which precludes intertie scheduling and/or inter-ISO coordination
  - If the resource is under contract and is needed to provide Blackstart capability for Ontario
  - To prorate the called capacity export if the intertie becomes congested with exports bid at +MMCP

# Settlements – CMSC

- Called Capacity Exports will be ineligible for CMSC
  - Bids are not reflective of participant costs so are not aligned with the intent of CMSC
  - Form and content (including bid price) are prescribed to ensure fulfilment of a scheduling obligation with an external jurisdiction

# Generator Guarantees

- Day-ahead and real-time guarantee programs were instituted to better incent generators with particular physical characteristics to be available to provide energy in real-time to support Ontario reliability
- There are times when a called resource can be reasonably assumed to have offered into the market in order to fulfill a requirement to the buying jurisdiction

# Generator Guarantees

Capacity Called?	Eligibility for Guarantee	Why?
Not called	Eligible	Committed for Ontario's projected needs
Called after it was committed for a generator guarantee	Eligible unless Ontario becomes inadequate and export is allowed to flow due to backing generator schedule	<ol style="list-style-type: none"> <li>1) Was committed based on Ontario's projected needs</li> <li>2) Export would normally have been constrained off. Therefore generator is no longer producing for Ontario need</li> </ol>
Called before it was committed for a generator guarantee	Not eligible	Generator can be assumed to have offered to support the called export

# Generator Guarantees

- If a generator is called that is also eligible for a DA-PCG or RT-GCG payment, the IESO will claw back the payment at the end of the month
- Participants can then enter a Notice of Disagreement to have the funds restored if:
  - The Capacity Call occurred after the Capacity Resource was committed through a guarantee program, or
  - The Capacity Call was withdrawn prior to real time
    - Participants can also NOD export failure charges related to the withdrawn capacity call

# Next Steps

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# Next Steps

- By project completion, several Market Manuals will be updated to provide detailed MP and IESO processes and timelines. Manuals may include:

Market Manual	Capacity Export Related Content
1.2: Facility Registration, Maintenance and Deregistration	Submission and processing of Commitments
4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets	Called Capacity Export bid timing and content
4.3: Real-Time Scheduling of the Physical Markets	Scheduling of Called Capacity Exports including curtailments
7.1: IESO-Controlled Grid Operating Procedures	Updated Emergency Operating State Control Actions list
7.3: Outage Management	Outage management processes related to externally committed capacity resources
A new Capacity Exports specific manual	Submission and review processes for Capacity Export requests

# Overview of Proposed Market Rule Changes

- Market rule amendments will be proposed to implement design features not yet in place and to specify certain IESO and market participant rights and obligations
- New section – Capacity Exports, includes:
  - Market participant and IESO rights and obligations for certain capacity export processes
  - Market participant capacity export requests
  - IESO review of submitted capacity export requests
  - Capacity commitment information
  - Capacity calls



# Overview of Proposed Market Rule Changes

- Amendments related to scheduling:
  - Dispatch, scheduling and curtailment during capacity calls
- Amendments related to outage management
  - IESO authority to reject or deny a transmitter planned outage in certain circumstances if the outage restricts a capacity resource from connecting to the IESO-controlled grid (i.e., makes the capacity resource grid incapable)
- Amendments related to settlements
  - Specify when a capacity resource will be ineligible for RT-GCGs, DA-PCGs
  - Indicate that called capacity exports are ineligible for CMSC

# Next Steps

- Feedback on this presentation can be sent to the IESO by April 26
- The nature of feedback will determine whether a future engagement webinar is required, or if responses can be provided by email
- As early as May 22, the IESO will take market rule amendments to Technical Panel to ask that they be posted for broader stakeholder comment
  - The IESO will inform participants of this engagement initiative of the outcome of that meeting
  - You can register to observe that meeting by emailing [engagement@ieso.ca](mailto:engagement@ieso.ca).

# Appendix

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# Proposed Market Rule to Market Manual Cross Reference

- The proposed market rules will make reference to certain details, processes and information that will be provided in market manuals. Details, processes and information anticipated to be provided in market manuals include (without limitation) the following:
  - MP capacity export requests – eligibility, timelines and information to be submitted (slides 14 - 20)
  - IESO review and approval/denial of capacity export requests – IESO review steps, timing and details (slides 21 - 35)
  - MP commitment information – timelines and information to be submitted (slide 36)
  - Outage related processes (slide 37)

# Proposed Market Rule to Market Manual

## Cross Reference

- MP timelines and obligations for called capacity exports (slides 38 - 40)
- IESO curtailment of called capacity exports (slide 41)
- RT-GCGs, DA-PCGs and CMSC - procedural details and information (slides 42 - 45)