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**APRIL 22, 2022**

# Hybrid Integration Project: Design for Foundational Hybrid Facility Participation Models

## Webinar Participation (including audio)

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- This webinar is conducted according to the [IESO Engagement Principles](#)

# Purpose



- Respond to stakeholder feedback received following the February engagement
- Formalize the design for hybrid facility participation in IESO markets for the two foundational models and outline next steps

# Agenda

- Recap
- Stakeholder Feedback and IESO Response
- Next Steps

# Introduction

- Over the last year, the IESO has worked with stakeholders to develop the foundational design for hybrid resources in Ontario
- The market design and integration phase has developed the market design for the two foundational hybrid models, providing clarity on how each model will participate in the IESO-administered markets
  - This design was developed in coordination with procurement work, enabling hybrid facilities to participate in the Long-Term Procurement
- Key deliverable is the design document for the co-located and integrated hybrid models

# Project Recap

Month		Key Activity and Description
April-Dec 2021	✓	Identified foundational hybrid facility models in consultation with stakeholders
Dec 2021	✓	Discussed approach for design stage, identified design modules (capacity participation, authorization and registration, grid and market operations & market settlement), and timelines for completion in alignment with the LT RFP process
Jan 2022	✓	Presented "day-in-the-life" participation models Understanding of key attributes of the foundational hybrid models High-level review of existing resource models utilized for hybrids Considerations for each hybrid model from DA to RT under MRP
Feb 2022	✓	Presented draft design models for stakeholder discussion Discussed proposed decisions for all design elements within modules Provided clarity on capacity qualification & market power mitigation
April 2022		Address stakeholder feedback; finalize design models
June 2022		Publish Hybrid Design Document

# Stakeholder Engagement

- The IESO received written feedback from 14 stakeholders over the course of the design phase to date, with participation by many more
- Stakeholders are generally supportive of the proposed designs for the two foundational hybrid facility models
- Requests for clarity have been received with respect to various topics including implementation, capacity qualification, connection assessment & approval process, regulatory and legislative matters, and participation

# Stakeholder Feedback - Implementation

## Feedback Theme

## IESO Response

What is the implementation plan for hybrids and for storage uplift allocation changes?

- The plan is to implement both foundational models post-MRP, but prior to the beginning of the LT RFP commitment period
- Based on stakeholder feedback, the IESO is reviewing whether the co-located model and uplift allocation changes can be implemented sooner
- Detailed plans including market rule changes will be developed in conjunction with other in-flight IESO priority projects such as MRP
- IESO will update stakeholders on implementation planning by June 2022, when the design document is published



# Stakeholder Feedback – Capacity

## Feedback Theme

## IESO Response

Does the sum of the UCAPs for the individual resources fully reflect the capabilities and capacity value of hybrid facilities?

- Co-located model allows no market interactions between resources, therefore the capacity qualification to assess unforced capacity (UCAP) is separate for each individual resource, and sum of the UCAPs fully reflects the capacity value of the hybrid facility
- Integrated model allows interactions between the injecting resources, and the sum of the UCAPs is a reasonable starting point

The IESO is currently consulting with stakeholders through a separate engagement: <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Resource-Adequacy-Engagement>

# Stakeholder Feedback – Connection Assessment

## Feedback

## IESO Response

Can the connection process, in particular the System Impact Assessment (SIA), be more clearly defined for hybrids for the LT RFP process?

- The connection process and the SIA are described in significant detail on the IESO website at: [Overview of the Connection Process \(ieso.ca\)](https://www.ieso.ca/Overview-of-the-Connection-Process)
- SIA is part of “Obtain Conditional Approval to Connect” in the timing diagram below and in the IESO materials
- For more information, contact IESO Connection Assessments at: [connection.assessments@ieso.ca](mailto:connection.assessments@ieso.ca)



# Stakeholder Feedback – Connection Assessment (2)

## Feedback

## IESO Response

Will the connection process delay the in-service date for LT RFP projects?

- The SIA part of the connection process is not generally a barrier to completion
- The “Design and Build” is more time-consuming, but this part of the process is under proponent control
- For more information, contact IESO Connection Assessments at: [connection.assessments@ieso.ca](mailto:connection.assessments@ieso.ca)

Prepare Application (1 - 2 months)	Obtain Conditional Approval to Connect (11 - 13 months)	Design and Build (18 - 36 months)	Authorize Market and Program Participation (1 month)	Register Equipment (3 - 4 months)	Commission Equipment and Validate Performance (3 - 4 months)
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# Stakeholder Feedback – Expedited SIA

## Feedback

## IESO Response

Does the Expedited System Impact Assessment (ESIA) shorten the timelines for completing connection assessment?

- ESIA allows the connection assessment process to begin prior to signing of a cost recovery agreement with deposit; for example, ESIA applies to an existing participant adding a facility <10 MW capacity
- See Section 9.2 of [Market Manual 1.4](#) for more detail; ESIA initiates the process more quickly, but the process itself is not altered
- Whether SIA or ESIA, the timelines are dependent on complexity of the project and the connection area; assessment must be thorough to ensure reliability of the grid is maintained
- For a hybrid facility with existing generator adding storage behind existing connection point, complexity is determined by impact on the connection point and intended operations
- For more information, contact IESO Connection Assessments at: [connection.assessments@ieso.ca](mailto:connection.assessments@ieso.ca)

# Stakeholder Feedback – Regulatory and Legislation

## Feedback

## IESO Response

Will the IESO coordinate with the OEB and Ministry of Energy on behalf of stakeholders?

- IESO has informed Ontario Energy Board (OEB) and Ministry of Energy (MoE) that the IESO is enabling hybrid facilities
- For clarity on the IESO role:
  - OEB: As there are multiple ownership and relationship structures possible for hybrid facilities, the OEB has recommended that proponents, or industry associations, should contact the OEB directly to confirm the licensing requirements for their situation by providing specific questions and project information. The OEB can be contacted at [IndustryRelations@OEB.ca](mailto:IndustryRelations@OEB.ca)
  - MoE: IESO has identified potential need for amendment to the Global Adjustment Regulation for grid-charging under the integrated model, and IESO will continue to consult with MoE on this matter

# Stakeholder Feedback – Dispatch Instructions

## Feedback

## IESO Response

Could IESO dispatch instructions inappropriately impact the operations of a hybrid facility, requiring curtailment of energy?

- Similar to all other IESO facilities, it is possible that hybrid facilities may be curtailed in the case of a security constraint or if they are not scheduled due to economics (e.g., offer price is -\$3/MWh but market price is -\$100/MWh)
- The IESO must ensure that scheduling of resources supports the operation of the grid at all times
- However, under normal circumstances, hybrid facilities will not be curtailed:
  - Under the co-located model, a VG resource will normally be able to inject according to ambient conditions
  - Under the integrated model, it is up to the participant to manage its bids/offers, and the storage technology will be able to help manage fluctuations in generator fuel
    - The storage load may lower the bid quantity for charging from the grid and/or charge storage behind-the-meter

# Stakeholder Feedback – Self-Scheduling VG

## Feedback

## IESO Response

Can VG be self-scheduling in IESO markets?

- All VG participating in the IESO markets are dispatchable
- Although dispatchable, under the IESO VG model the generator is allowed to inject according to ambient conditions in real-time unless there is a line security constraint that requires the generator to reduce output or if the generator is uneconomic
- The variability of the VG fuel is addressed through the current VG model, while considering system constraints that may occur

# Stakeholder Feedback – Embedded Generation

## Feedback

## IESO Response

How will distribution-embedded facilities participate?

- Embedded retail generation and hybrids intending to participate in the IAMs must follow established authorization and registration processes, along with any applicable LDC requirements
- IESO market participants must participate exclusively in the IAMs; the Transmission-Distribution Coordination Working Group of the IESO supports reliability while ensuring there are no conflicting instructions, double-counting, or other unintended consequences:

<https://ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Transmission-Distribution-Coordination-Working-Group>



## Next Steps



- Formal responses to all stakeholder feedback received following the February engagement session will be provided on the [project's webpage](#)
- The IESO is appreciative of stakeholder input to help complete the market designs of the two foundational models
  - Should provide sufficient detail to facilitate participation in the LT RFQ/RFP process
  - The design document will be published by June 2022
- Further information regarding implementation will be provided as these plans are developed, including updates on possible early implementation of the co-located model and uplift allocation changes for storage

# Stakeholder Feedback



- IESO questions:
  - Are there any other items where the IESO could provide further clarification?
- Please use the feedback form found under the April 22, 2022 entry on the [Hybrid Integration Project webpage](#) to provide feedback and send to [engagement@ieso.ca](mailto:engagement@ieso.ca) by May 13, 2022
- The IESO is able to meet with stakeholders to clarify information presented today, as well as discuss any further questions

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# Thank You

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