Market Renewal Energy | Market Rules and Manuals Batch Education:
Market Entry and Prudential Security

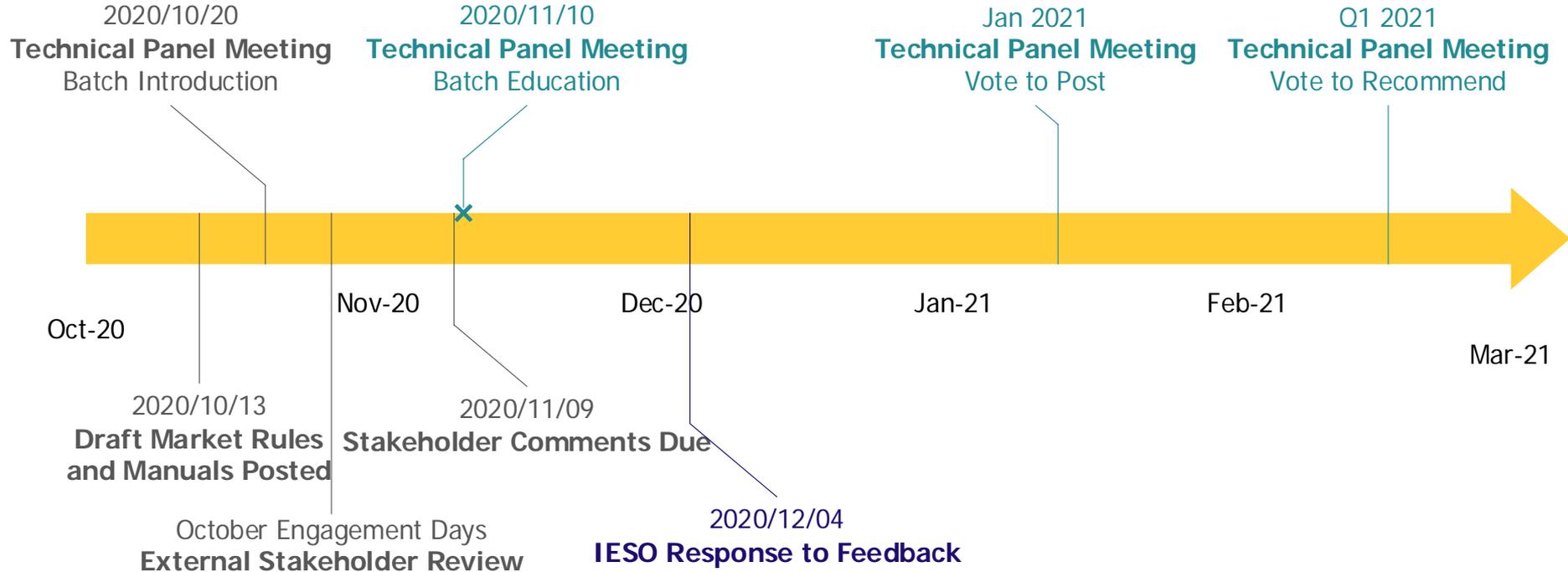**Mark Gojmerac and Anna Lafoyiannis**
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Objective

Education on key design elements of market renewal and their consequential impacts to the market rules and manuals considered in the Market Entry and Prudential Security batch:

- Introducing a financially binding day-ahead market (DAM)

  - Enabling virtual transactions

  - Introducing price responsive loads

- Improving scheduling of dispatchable non-quick start resources and dispatchable hydroelectric resources

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Market Entry and Prudential Security Timeline

2020/10/20
Technical Panel Meeting
Batch Introduction

2020/11/10
Technical Panel Meeting
Batch Education

Jan 2021
Technical Panel Meeting
Vote to Post

Q1 2021
Technical Panel Meeting
Vote to Recommend

Oct-20

Nov-20

Dec-20

Jan-21

Feb-21

Mar-21

2020/10/13
**Draft Market Rules
and Manuals Posted**

2020/11/09
Stakeholder Comments Due

October Engagement Days
External Stakeholder Review

2020/12/04
IESO Response to Feedback

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Relevant Design Elements

- The Market Renewal Energy design is driving changes to the market rules and manuals. Aspects of the design that are relevant to the Market Entry and Prudential Security batch are:

  - Introduction of a Day-Ahead Market (DAM); and

  - Improved Scheduling for Dispatchable Non-Quick Start and Hydroelectric Resources

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Market Entry and Prudential Security: Summary of Changes

Authorization & Participation

- Authorize virtual traders
- Authorize price responsive loads

Prudential Security

- Separate prudential support framework for virtual and physical transactions

Facility Registration

- New facility info for price-responsive loads and dispatchable resources

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Impacted Market Rules and Manuals

Authorization and Participation	
Describes the process and requirements for prospective market participants to become authorized to participate in the IESO-administered markets	Chapter 2 - Participation Chapter 11 - Definitions Market Manual 1.5 - Market Registration Procedures

Prudential Security	
Describes the prudential support that is required to be authorized as a market participant, as well as the processes for daily monitoring of actual exposure	Chapter 2 – Participation Chapter 2: Appendix 2.3 – Prudential Support Chapter 11 – Definitions Market Manual 5.4 – Prudential Support

Facility Registration	
Describes the requirements for registering facilities and associated resources for IESO-administered markets	Chapter 7 - System Operations and Physical Markets Chapter 11 - Definitions Market Manual 1.5 - Market Registration Procedures

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Design Element:
Day-Ahead Market

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Day-Ahead Market: Impact on Batch

Authorization & Participation	Prudential Security	Facility Registration
Most existing and future market participants must be authorized to participate in the day-ahead market	• Prudential requirements modified to capture participation in both DAM and the real-time market, and exposure to locational prices vs. Ontario Zonal Price • Tighter screening for virtual transactions given higher risk profile	• None

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Day-Ahead Market: Key Design Elements

There are three key elements of DAM that impact the Market Entry and Prudential Security batch of market rules and manuals:

1) Introduction of separate settlement and pricing designs for participating resources vs. non-dispatchable loads;

2) Introduction of virtual transactions; and

3) Demand side participation via price responsive loads

Day-Ahead Market: (1) Settlement and Pricing

Two Settlement System (All Other Participating Resources)	Modified Settlement (Non-Dispatchable Loads)
• Day-ahead participation incentivized with an ability to lock in day-ahead prices. • Day-ahead schedules are balanced against real-time outcomes at the locational marginal price. $Q_{DA} \times \$_{DA} + (Q_{RT} - Q_{DA}) \times \$_{RT}$	• IESO will continue to forecast day-ahead consumption for all non-dispatchable loads. • Real-time consumption is charged the Ontario Zonal Price plus a price adjustment to account for IESO day-ahead forecast deviation. $Q_{RT} \times (\$_{DA} + \$_{Forecast\ Deviation})$

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Authorization and Participation Changes

Chapter 2 - Participation

Change Description	Market Rule Section(s)
Expand the scope of the authorization provisions to include the day-ahead market	1.2.2.2, 1.2.4

Chapter 2 – Prudential Support

Change Description	Market Rule Section(s)
Specify that prudential support is a condition for participation in either the real-time market or day-ahead market	5.1.1

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Prudential Security Changes

Chapter 2 – Prudential Support (Physical Transactions)

Change Description	Market Rule Section(s)
Clarify how the IESO currently and will continue to determine the minimum trading limit for physical transaction	5.3.4.2 and 5.3.4.3
Specify that the price bases used for determining the minimum trading limit and default protection amount will be based on (i) locational marginal price or average Ontario zonal price, as appropriate, rather than the regulated price plan; and (ii) applicable OEB published prices	5.3.10A and 5.3.10C
Specify that energy traders will be ineligible for reductions associated with credit ratings until they reach three months of market activity	5.8.6.3

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Day-Ahead Market: (2) Virtual Transactions

- Virtual transactions are offers and bids from non-physical resources, allowing them to compete with physical resources in the DAM

- Increasing the resource pool in the DAM reduces the impact of strategic under-bidding from physical resources on DAM prices

- Virtual transactions help day-ahead and real-time prices converge by arbitraging predictable price differences between the two markets

- Virtual transactions carry a higher degree of two settlement exposure because there is no physical limit on what they can offer or bid in the DAM

Day-Ahead Market: (2) Virtual Transactions (Cont'd)

- Virtual transactions are settled like physical transactions. Since there is never any real-time supply or consumption, settlement is simplified to:

$$Q_{DA} \times (\$_{DA} - \$_{RT})$$

- A virtual offer will occur when the virtual trader expects $\$_{DA} > \$_{RT}$

- A virtual bid will occur when the virtual trader expects $\$_{DA} < \$_{RT}$

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Authorization and Participation Changes

Chapter 11 - Definitions

Change Description	Definitions
Add new defined terms to describe authorization/participation types	virtual trader
Add new defined terms to describe transaction types	physical transactions, virtual transactions
Remove defined terms	financial market participant

Authorization and Participation Changes

Chapter 2 - Participation

Change Description	Market Rule Section(s)
Replace references to "financial market participant" with "TR participant" and/or "virtual participant", as applicable	1.2.2.6, 2.1.1.7, 2.1.1.13, 2.1.1.14, 3.1.2.2
Add virtual traders to the HST exemption list	1.2.2.6 and 3.1.2.2
Add a requirement for virtual traders to submit market associate information as part of the authorization process	1.2.2.7

Authorization and Participation Changes

Market Manual 1.5 - Market Registration Procedures

Change Description	Market Manual Section(s)
Add virtual traders as a Market Participant Class	Table 2-3 in 2.2.2
Add and modify pre-requisite requirements when authorizing as a virtual trader.	2.2.1
Improve alignment between classes of Market Participants and Authorization Types	2.2.2

Prudential Security Changes
Chapter 11 - Definitions

Change Description	Definitions
Modify to supplement existing prudential definitions to make definitions more descriptive, and to incorporate day-ahead virtual transactions and consolidated monitoring (for market participants authorized to conduct both physical and virtual transactions)	actual exposure, default protection amount, margin call, maximum daily trading limit, maximum net exposure, prudential support, trading limit, self-assessed trading limit, virtual transaction

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Prudential Security Changes

Chapter 2 – Prudential Support (Differentiation of transaction types)

Change Description	Market Rule Section(s)
Specify which prudential market rule provisions are applicable to market participants based on their authorizations to participate in the IESO-administered markets	throughout 5
Amend the existing provisions on prudential support to specify their applicability to physical transactions, virtual transactions, or both in the day-ahead and real-time market	throughout 5
Specify which sections apply to market participants conducting physical transactions, virtual transactions or both physical and virtual transactions; articulated section for capacity prudential support obligations	5.1.3 - 5.1.5

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Prudential Security Changes

Chapter 2 – Prudential Support (Virtual Transactions)

Change Description	Market Rule Section(s)
Create a new section for day-ahead virtual transactions by largely mirroring the physical transaction market rule provisions	5C
Specify calculation of participant trading limit (TL), default protection amount (DPA) and maximum net exposure (MNE = TL + DPA)	5C.1
Obligate market participants to submit a maximum daily trading limit (MWh)	5C.1.2
Specify IESO determined price delta for determining TL and DPA	5C.1.9
Specify margin call warning and margin call requirements	5C.2 and 5C.4

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Prudential Security Changes

Chapter 2 – Prudential Support (Virtual Transactions)

Change Description	Market Rule Section(s)
Specify IESO ability to reject bids and offers based on two virtual screening methods; Specify calculation of actual exposure	5C.3
Specify prudential support must be satisfied by a letter of credit	5C.5.2
Specify reduction to virtual prudential support available to generators	5C.6.1

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Prudential Security Changes
Chapter 2 - Prudential Support (Both Physical and Virtual Transactions)

Change Description	Market Rule Section(s)
Create a new section for consolidated monitoring requirements for participants authorized to conduct both physical and virtual transactions	5D
Specify that the consolidated trading limit is the sum of the trading limit for physical transactions and virtual transactions	5D.1
Specify that the consolidated actual exposure is the sum of the exposure for physical transactions and virtual transactions	5D.2.2
Specify that the IESO may issue a consolidated margin call and consequently reject bids and offers for virtual transactions	5D.3
Specify that no margin call option is not an option if the market participant is authorized to conduct both physical transactions and virtual transactions	5.6.7

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Prudential Security Changes

Chapter 2 - Prudential Support

Change Description	Market Rule Section(s)
Incorporate consequential changes to the default levy provisions (i.e. expand for applicability to the day-ahead market – both physical and virtual transactions	8
Incorporate consequential changes to Appendix 2.3 – Prudential Support	Appendix 2.3

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Prudential Security Changes
Market Manual 5.4 - Prudential Support

Change Description	Market Manual Section(s)
Structurally reorganized to: • provide a more process-oriented document outlining steps that market participants are required to complete to satisfy prudential support requirements; • improve transparency of the prudential support processes and calculations; and • move some content that is currently in the Guide to Prudentials into Market Manual 5.4	Throughout

Note: Sections 2 and 3 cover prudential support for physical transactions, Sections 4 and 5 cover virtual transactions

Prudential Security Changes
Market Manual 5.4 - Prudential Support

Change Description	Market Manual Section(s)
Setting Prudential Support Obligations and Daily Monitoring for Physical Transactions • The proposed reduction applicable to energy traders will not be required as the existing methodology for calculating the PSO already allows energy traders that achieve net creditor status to reduce their PSO in situations where the proposed reduction would apply	2-3
Setting Prudential Support Obligations for Virtual Transactions • Interim price delta based on shadow prices from the current day-ahead commitment process and the real-time market (similar for monitoring actual exposure) • The ability for a generator to use credit based on physical transactions to offset its virtual transaction PSO will be considered a reduction rather than a form of prudential support	4

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Prudential Security Changes
Market Manual 5.4 - Prudential Support

Change Description	Market Manual Section(s)
Daily Monitoring of Prudential Support for Virtual Transactions	5
Consolidated Process for Monitoring Physical Transactions and Virtual Transactions, Event of Default, and Capacity Prudential Requirements	6-8
Prudential Security Reports • The information related to the two physical transactions reports will be accessible through Online IESO • The two virtual reports will be available on the IESO Reports page	9

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Day-Ahead Market and Pricing: (3) Price Responsive Loads

• Allows for industrial loads to take a more active role in managing their energy costs by submitting bids into the DAM and locking in a day-ahead price for their expected consumption

• IESO will forecast real-time consumption as price responsive loads will continue to be non-dispatchable in real-time

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Facility Registration Changes

Chapter 11 - Definitions

Change Description	Definitions
Create new type of load resource that must register to participate in the IESO-Administered Market	price responsive load

Chapter 7 - System Operations and Physical Markets

Change Description	Market Rule Section(s)
Add timing requirements for load resources requesting a change to either a dispatchable load, non-dispatchable load, or price responsive load	2.2.25

Facility Registration Changes

Market Manual 1.5 - Market Registration Procedures

Change Description	Market Manual Section(s)
Include price responsive loads in day-ahead market	3.5
Add registration requirements for a wholesale consumer to participate with a price responsive load	4.2.2

Design Element:
Improved Scheduling for Dispatchable Non-Quick Start and Hydroelectric Resources

Improved Scheduling: Impact on Batch

Authorization & Participation	Prudential Security	Facility Registration
• None	• None	• Replace RT-GCG and DA-PCG eligibility with GOG status • Establish eligibility for dispatchable hydroelectric resources to submit new dispatch data into the market

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Improved Scheduling: Key Design Elements

- Introducing a new pre-dispatch engine that optimizes non-quick start resources over multiple hours requires a new cost recovery mechanism for the market – the generator offer guarantee (GOG);

- GOG replaces the Day-Ahead Production Cost Guarantee (DA-PCG) and the Real-Time Generation Cost Guarantee (RT-GCG) programs;

- Eligibility requirements for the GOG remain the same as they do today for RT-GCG and DA-PCG – applicable to all non-nuclear supply resources that need at least 1 hour to ramp up to their minimum loading point

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Improved Scheduling: Key Design Elements (cont'd)

- New dispatch data for dispatchable hydroelectric resources to better reflect their physical operating constraints:

  - Daily and hourly must run conditions;

  - Cascade hydroelectric dependencies;

  - Maximum starts per day; and

  - Forbidden regions

- DAM and pre-dispatch engines will respect these constraints when determining resource schedules

Facility Registration Changes

Chapter 11 - Definitions

Change Description	Definitions
Add new defined terms to describe registration parameters that also impact dispatch data submission	hourly must run, shared daily energy limits, start indication value, time lag

Facility Registration Changes
Chapter 7 - System Operations and Physical Markets

Change Description	Market Rule Section(s)
Add optional and mandatory registration parameters for resources associated with hydroelectric generation facilities, non quick-start generation facilities, and combined cycle generation facilities	2.2.6A, 2.2.6G, 2.2.6H
Delete sections discussing daily dispatch data and eligibility for generation cost guarantees/production cost guarantees.	2.2.6J, 2.2B, 2.2C
Specify the IESO's right to reject registration information submitted if resource-specific information submitted by a market participant does not conform to the technical capabilities of the resources	2.2.3C

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Facility Registration Changes

Market Manual 1.5 - Market Registration Procedures

Change Description	Market Manual Section(s)
Expand the scope of the registration provisions to include the day-ahead market	Throughout
Update order of registration parameters and remove references to day ahead commitment process	3
Add new and modify existing registration parameters (e.g., GOG Status, Hourly Must Run, etc.)	3.3 - 3.5
Include price responsive loads in day-ahead market	3.5
Add registration requirements for a wholesale consumer to participate as a price responsive load	4.2.2

Stakeholder Engagement Materials

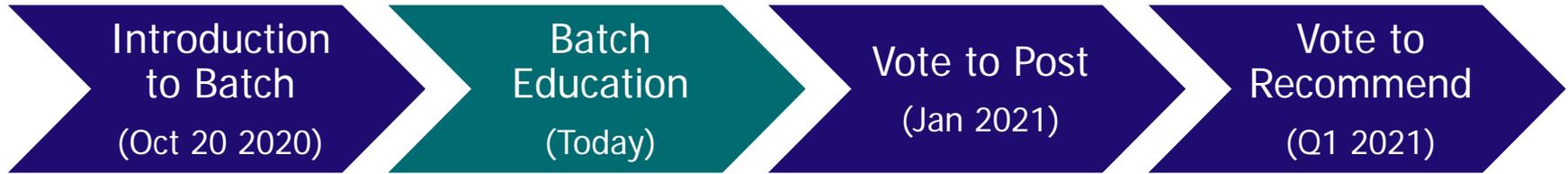Market Rules and Market Manuals amendments

Stakeholder Engagement Presentation

Guide to reading the amendments

Stakeholder feedback when available

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Market Entry and Prudential Security: Technical Panel Engagement

Introduction to Batch (Oct 20 2020)

Batch Education (Today)

Vote to Post (Jan 2021)

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