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IESO Innovation Roadmap: Progress Update

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Questions for SAC Input

1. In the current environment, what innovative solutions would you suggest the IESO focus on from an electricity market integration perspective in order to generate the greatest benefits for consumers from an a) near-term perspective b) longer-term perspective?
2. Grid modernization could be a strong driver for economic stimulus initiatives post-pandemic; if you could focus Ontario's electricity sector around a few key modernization initiatives, what would they be and why?

Overview

- Review of purpose of roadmap and priorities
- Highlights of 2020 activities
 - Energy Efficiency Pilot Auction
 - Indoor Agriculture Call
 - York Region Non-Wires Alternatives (NWA)
 - Storage Design Project
 - Distributed Energy Resource Integration Whitepaper
- Next steps – key areas of focus for 2021

Innovation Roadmap - Background

- In 2018 the IESO worked with stakeholders to develop the Roadmap and a three year (2019-2021) Work Plan
 - Stakeholders emphasized the need for **objective research** to better understand and prepare for challenges and opportunities
- Roadmap establishes priorities for **understanding** and **preparing** for the changes, challenges and opportunities facing the IESO and Ontario's electricity sector through 2030 to support a **cost-effective** and **reliable** electricity system
- The Work Plan sets out specific initiatives IESO will engage in or support

Roadmap Priority Areas of Focus

	Area of Focus Name	Timeline for onset of potential impacts related to area of focus			
		2019	2022	2025	2028
Highest Priority areas for Resource Allocation and Engagement	Unlock value of new and existing resources	[Timeline bar from 2019 to 2025]			
	Leadership with respect to emerging cyber security risks	[Timeline bar from 2019 to 2022]			
	Increase transparency and visibility of resources operating on the distribution system	[Timeline bar from 2019 to 2025]			
	New capability to collect, store, share, analyze and use data	[Timeline bar from 2019 to 2028]			
Important Areas Core to IESO Mandate	New methods for ongoing operation of an electricity grid with more intermittent supply resources and increasingly variable loads	[Timeline bar from 2022 to 2025]			
	Inform new distribution system operations and business models to support bulk market efficiency and reliability	[Timeline bar from 2022 to 2025]			
Monitor or Support Action of Others	Prepare for increase in customer-led and LDC-led DER deployment	[Timeline bar from 2019 to 2025]			
	Prepare for changing consumer choice	[Timeline bar from 2022 to 2025]			
	Alternative approaches to provide system resiliency	[Timeline bar from 2022 to 2028]			

Energy Efficiency as a Capacity Resource in Auction Pilot

Developing pilot auction in broad alignment with the Capacity Auction (CA) to procure energy efficiency (EE) resources

EE participates in capacity auctions elsewhere (e.g. ISO-NE; MISO; PJM)

Pilot Objectives:

- Establish open competition for EE
- Discover minimum viable incentives for EE delivery
- Understand unique characteristics of EE as a capacity resource

Key 2020 milestones:

- Mar. 2020: 120 stakeholders participated in detailed design webinar
- June 2020: final detailed auction design posted

Upcoming milestones:

- Mar. 2021: EE auction to be held for Winter 2022/23 and Summer 2023 commitment period

Indoor Agriculture: GIF Targeted Call for Proposals

Grid Innovation Fund (GIF) call for proposals to demonstrate/evaluate innovative solutions to alleviate load growth in Ontario's fast growing greenhouse sector

Selected projects include:

Allegro Acres with Harrow Research & Development Centre: *Lighting Strategies to Reduce Peak Power Demand in Greenhouse* (\$6.5M total project value)

Great Lakes Greenhouse: *Energy Efficient Autonomous Greenhouse* (\$1M total value)

+2 more to be announced by year end



IESO York Region NWA Demonstration Project

Develop/test design of a local market to procure energy and capacity from distributed energy resources (DERs or Non-Wires Alternatives “NWA”) as cost-effective alternatives to traditional infrastructure to meet distribution level needs while enabling simultaneous bulk market participation

\$10M, 3-year project funded 50/50 by IESO and Natural Resources Canada with Alectra administering the local market

Nov. 2020: local capacity auction to take place for May-Oct. '21 commitment period



Storage Design Project (SDP)

To address barriers to storage participation in the IESO-administered markets (IAMs)

Developed with extensive engagement via the Energy Storage Advisory Group (ESAG)

Stakeholders cited need to enable hybrid and behind the meter (BTM) facilities

Next steps: IESO to update interim design for Market Renewal go live; IESO to develop work plan for integration of hybrid and BTM resources

Interim Design Status:

- Focus on maximizing storage participation in today's IAMs, within existing IESO tools
- Enables participation in energy, operating reserve, regulation service and Capacity Auction (with some limitations)
- Oct. 20, 2020: Technical Panel unanimously recommends adoption of market rule amendments

Long-Term Vision Status:

- Published long-term vision in September focused on storage participation once fully integrated in IESO tools
- Provides foundation for future storage design work

DER White Paper: Options to Enhance DER Participation

The IESO has developed a two-part white paper series exploring approaches to expanding ability of distributed energy resources (DERs) to compete in the IESO-Administered Markets (IAMs)

Part I (2019) identifies obstacles to DER participation and the universe of potential solutions

Part II (Nov. 2020) identifies specific solutions to barriers that merit further consideration for future design work/pilot exploration in Ontario

If pursued, solutions could bring IAMs in alignment with recent regulation requiring system operators in the U.S. to fully enable DERs in wholesale markets



Next Steps/Key Areas of Focus for 2021

- **Distributed Energy Resources:** develop roadmap/vision to set out approaches/timing for fully enabling DERs to compete in IESO-administered markets for all products/services they are technically capable of providing
- **Hybrid Storage Facilities:** advance work on understanding hybrid facility capabilities and market/system integration options and requirements

Thank You

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