



A leading partner in a
smart energy future

Project MERLIN & the Ontario Landscape

Presentation for Project MERLIN Internal
Workshop

February 4, 2021



AGENDA

- 1. Ontario Electricity Sector Overview**
- 2. Hot Topics in Ontario's Sector**
- 3. MERLIN's Relevance in Ontario Context**
- 4. MERLIN & Other Canadian Jurisdictions**
- 5. Q&A**

A photograph showing a person's hands wearing blue gloves, working on a laptop keyboard. The background is a solid blue color. Overlaid on the blue background is a white text area containing the title.

ONTARIO ELECTRICITY SECTOR OVERVIEW

ONTARIO – QUICK FACTS



- Canada's most populous province (14.6 million; ~39% of national population)
- 1.076 million km² (4 times larger than U.K.)
- Diverse geography
- Home to Canada's biggest city, Toronto
- Largest economy of any Canadian province (~37% of national GDP)
- Major economic sectors include financial and professional services, manufacturing
- Canadian Constitution grants provinces significant authority over energy and natural resources

Source: Natural Resources Canada



1 | ONTARIO ELECTRICITY SECTOR OVERVIEW

A Complex Landscape

Generation
Transmission
Distribution

Policy
Regulation
Market



KEY PLAYERS IN THE SECTOR

Ministry of Energy, Northern Development and Mines



- Sets legislative and policy framework for electricity and natural gas sectors
- Oversees OEB and IESO (with directive powers granted by statute)
- Led by Provincial Cabinet Minister

Ontario Energy Board



- Sector regulation, oversight
- Statutory mandates include protecting consumer interests and promoting efficiency, cost effectiveness in sector
- Administers and enforces numerous regulatory instruments

Independent Electricity System Operator



- Bulk system operations and reliability
- Market administration, oversight
- Long term planning and procurement
- Smart grid data repository
- Energy efficiency programs

Generators



- Generation investment, ownership, operation
- Participation in IESO market
- Government-owned OPG is largest; produces half of Ontario's supply
- Many privately-owned generators

Transmitters



- Transmission investment, ownership, operation
- Compliance with IESO and North American reliability requirements
- Hydro One owns 97% of transmission grid in Ontario

Local Distribution Companies



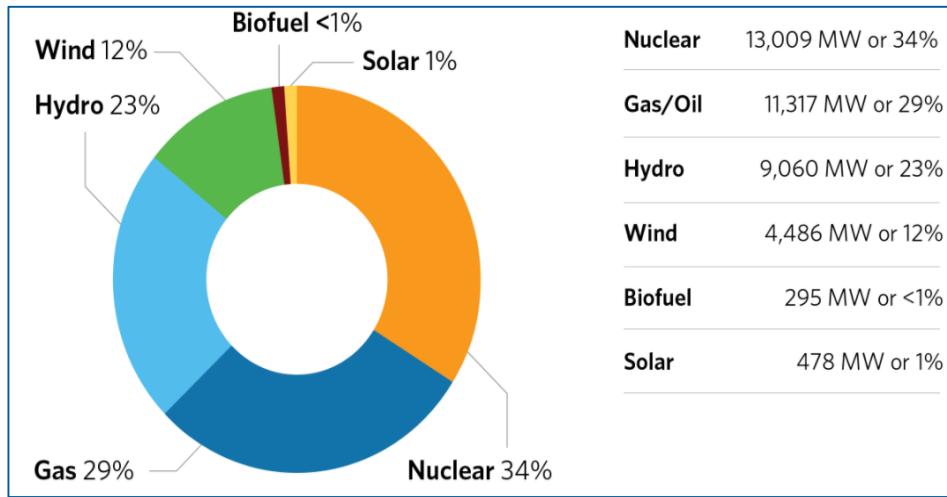
- Safe and reliable service
- Obligation to connect and serve
- Distribution system planning
- Compliance with OEB rules
- 60+ distribution utilities in Ontario; four largest serve 66% of customers

- Other sector participants include third-party service providers (retailers, demand response companies, data managers) and consumers



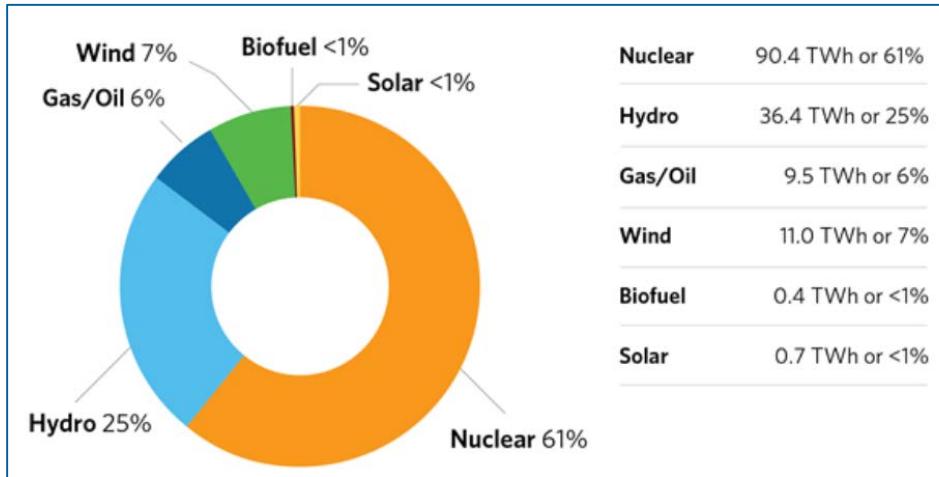
SUPPLY MIX

Ontario's Installed Generation Capacity – 38,644 MW (2021)



N.B. this chart does not include 3,578 MW of IESO-contracted capacity that is connected at the distribution level

Ontario Electricity Generation by Fuel Type – 148 TWh (2019)



In 2019, Ontario's electricity generation was 94% non-emitting

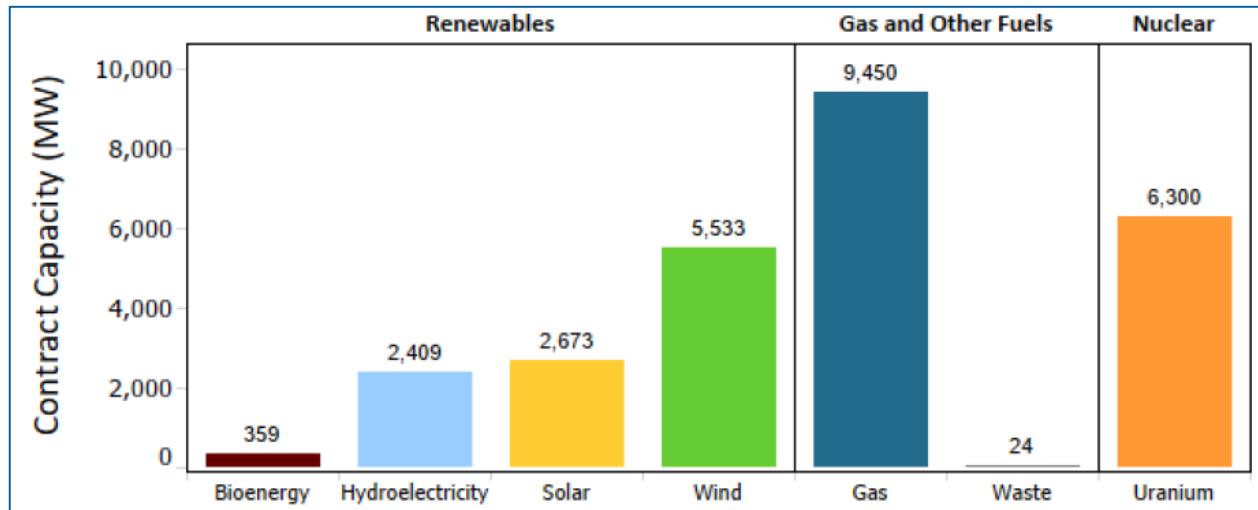


Source: IESO

SUPPLY MIX – CONTRACTED CAPACITY

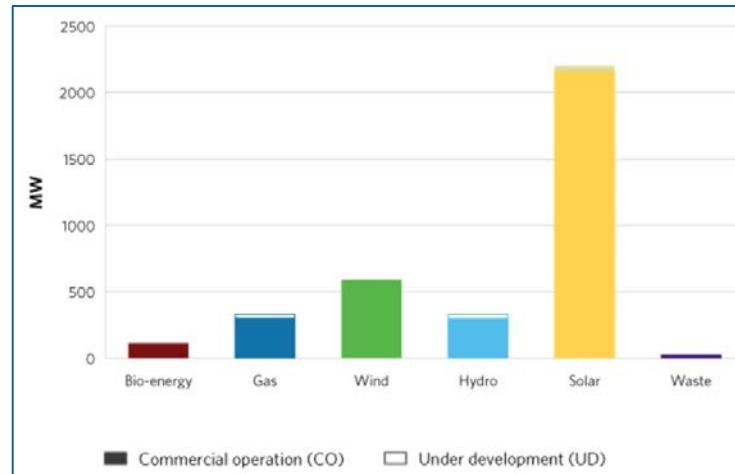
Total Contracted Generation Capacity – 26,749 MW (2021)

N.B. this graph includes transmission- and distribution-connected capacity



Contracted capacity represents ~63% of total capacity in Ontario (transmission- and distribution-connected)

Distribution-Connected Contracted Generation Capacity – 3,578 MW (2021)



Solar resources represent ~60% of total Dx-connected contracted capacity (2,195 MW)

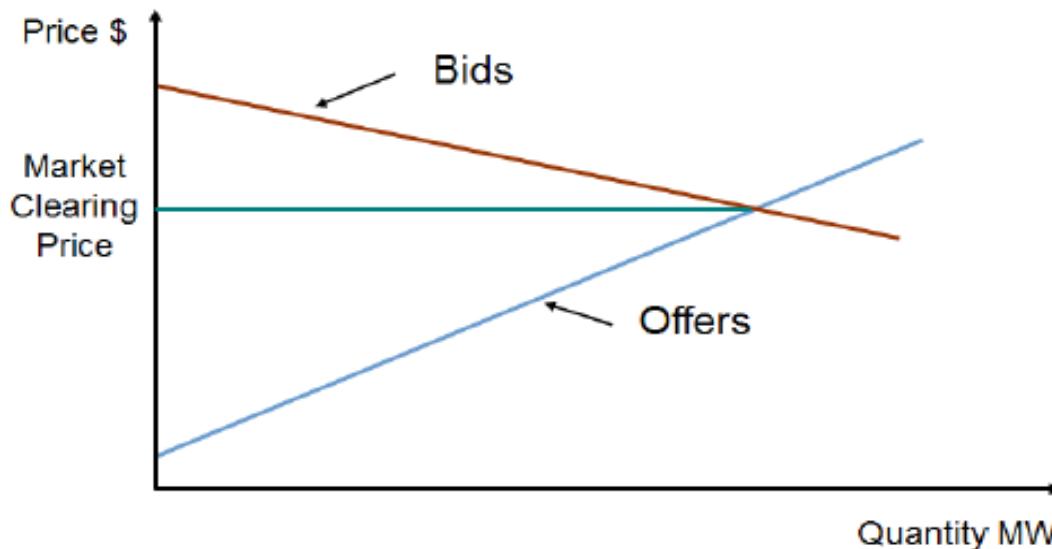
Source: IESO

MARKET STRUCTURE – FROM COMPETITIVE TO HYBRID

- 1998 – Ontario government re-structures energy sector, with goal of injecting greater competition (in step with U.S. developments)
- May 2002 – Ontario's competitive market goes live
- November 2002 – rate freeze is instituted as a result of price volatility, market gaming, and public outcry
- 2003 – new government directs phase-out of coal-fired generation (which represented 25% of provincial supply at that time)
- Key implementation actions in subsequent years:
 - Establishing new retail pricing (Regulated Price Plan and time-of-use rates)
 - Procuring significant amounts of new natural gas and renewable (both large and micro) generation capacity through long-term contracts
- **Result has been hybrid market – competitive structure overlaid by large contracted supply which doesn't respond to market signals**



HOW IESO'S WHOLESALE PRICE IS DETERMINED



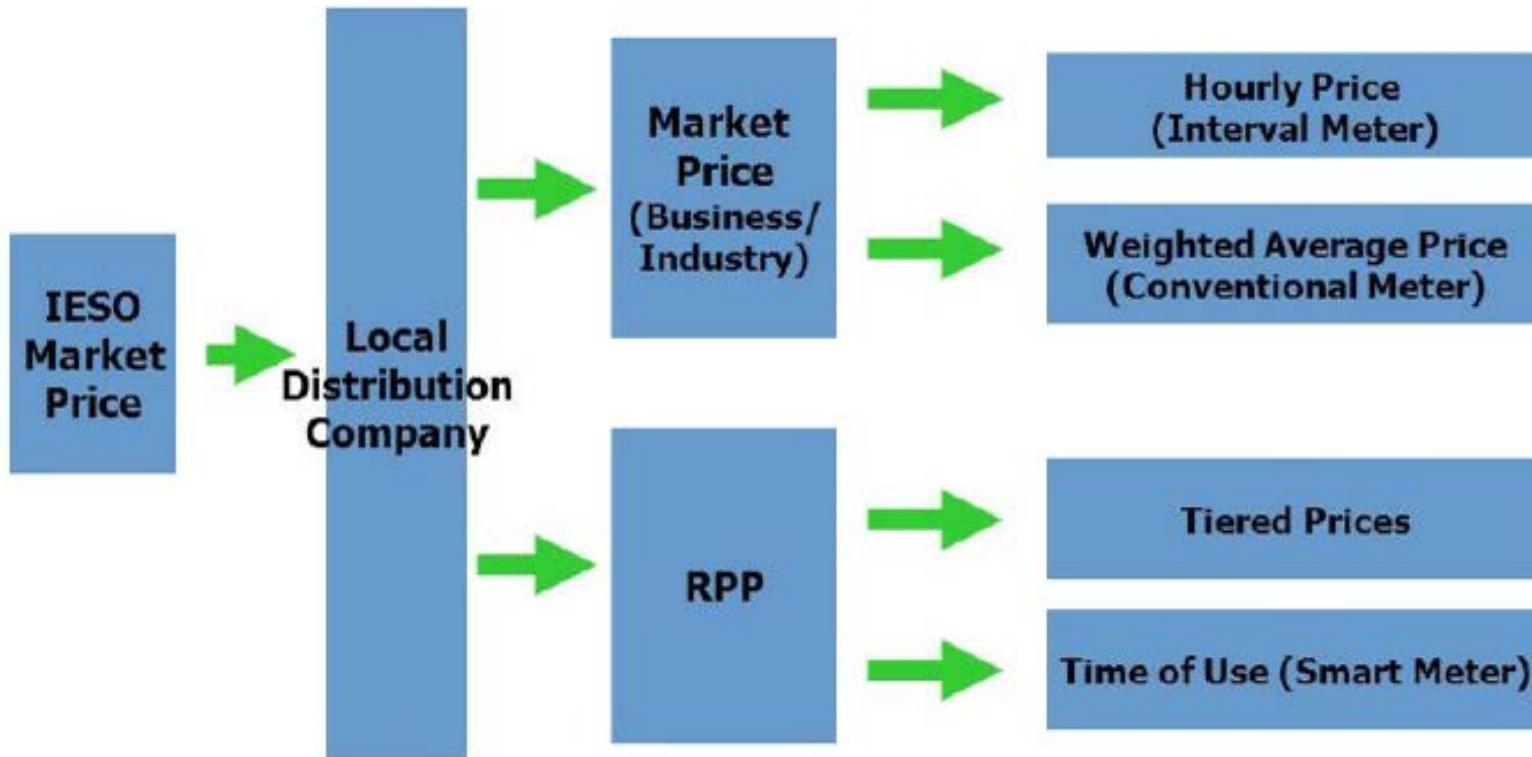
Source: IESO

- Each day, IESO issues forecasts of expected demand
- Offers to supply and bids to purchase are then submitted into the market
- IESO sets market price where supply meets demand, beginning with lowest-cost offers and then accepting more expensive generation
- A new market clearing price is established every five minutes
- The average of the 12 clearing prices in each hour is called the Hourly Ontario Energy Price (HOEP)
- HOEP is province-wide; currently no locational marginal pricing (LMP)

MARKET PRICE → CUSTOMER PRICE



How Customers Pay for Electricity



MARKET PRICE → CUSTOMER PRICE (CONTINUED)

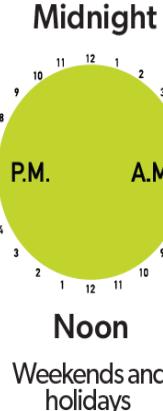
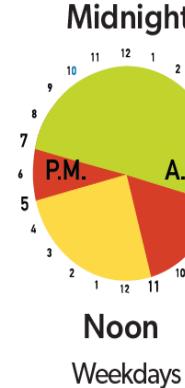
- Residential and small business customers pay RPP commodity rates
- RPP = generation costs (HOEP) + Global Adjustment (GA)
- GA consists of a mix of assorted costs – contracted and regulated OPG generation costs, demand response, conservation
- OEB updates RPP prices on May 1 and November 1 of each year; updates are based on 12-month forecast of costs to supply RPP customers
- As of November 1, 2020, tiered pricing is available under RPP, in addition to the long-standing time-of-use option

Time-of-Use (TOU) prices per kilowatt hour:

OFF-PEAK **8.5 ¢**

MID-PEAK **11.9 ¢**

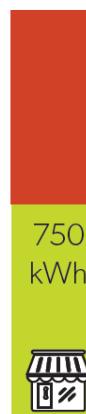
ON-PEAK **17.6 ¢**



Tiered prices per kilowatt hour:

Residential
Above 1,000 kWh monthly:
11.8 ¢

First 1,000 kWh monthly:
10.1 ¢



Small business
Above 750 kWh monthly:
11.8 ¢

First 750 kWh monthly:
10.1 ¢

ELECTRICITY SYSTEM PLANNING

Independent Electricity System Operator

IESO, Transmitters, Local Distribution Companies

Local Distribution Companies

Bulk System Planning

Regional Planning

Distribution Network Planning

Bulk System Planning

- 500 kV & 230 kV transmission
- Interconnections
- Inter-area network transfer capabilities
- System reliability (security and adequacy) to meet NERC, NPCC, ORTAC
- Congestion and system efficiency
- System supply and demand forecasts
- Incorporation of large generation
- Typically medium- and long-term focused

Regional Planning

- 230 kV & 115 kV transmission
- 115/230 kV autotransformers and associated switchyard facilities
- Customer connections
- Load supply stations
- Regional reliability (security and adequacy) to meet NERC, NPCC & ORTAC
- ORTAC local area reliability criteria
- Regional/local area generation & CDM resources
- Typically near- and medium-term focused

Distribution Network Planning

- Transformer stations to connect to the transmission system
- Distribution network planning (e.g. new & modified DX facilities)
- Distribution system reliability (capacity and security)
- Distribution connected generation and CDM resources
- LDC demand forecasts
- Near- and medium-term focused

Source: IESO

LEGISLATIVE & REGULATORY FRAMEWORK

- The framework underpinning Ontario's electricity sector rests on two statutory pillars – the *Electricity Act* and *Ontario Energy Board Act*

<i>Electricity Act</i>	<i>Ontario Energy Board Act</i>
Focuses on electricity adequacy, reliability, safety, sustainability, planning, conservation	Sets out (i) OEB's objectives, powers, duties, governance; and (ii) Minister of Energy's powers in relation to OEB
Articulates governance provisions for government-owned IESO, OPG, and partial ownership of Hydro One	Articulates oversight framework for electricity and natural gas sectors (basis for OEB's various regulatory instruments)
Sets out legislative framework for Ontario's electricity markets	Grants OEB authority to approve just and reasonable rates
Governs activity of Smart Metering Entity (collects and stores low-volume consumers' smart meter data)	Grants OEB certain powers of enforcement (audits, inspections, investigations, penalties)
Enabled sector re-structuring in 1998	

KEY REQUIREMENTS FOR ONTARIO LDCs

LDC Obligations

- Under the *Electricity Act*, OEB regulation, and terms of its OEB-issued license, an LDC has the following fundamental obligations:
 - Sell electricity to every person connected to its distribution system
 - Provide non-discriminatory access to its distribution system to consumers, generators, and retailers
 - Connect buildings (i.e. customers) to its distribution system
 - Maintain the integrity of its distribution system
- Under the *OEB Act*, distributors are only permitted to carry out the business of electricity distribution
 - There are narrow exceptions (see slide 32)
- **Distributors are not granted any authority/responsibility over resource adequacy and/or contracting for generation supply**

A blue-tinted photograph showing two people from the waist down, sitting at a table covered with papers and a laptop. One person's hand is visible, holding a pen over a grid-lined paper. The scene is set in an office environment.

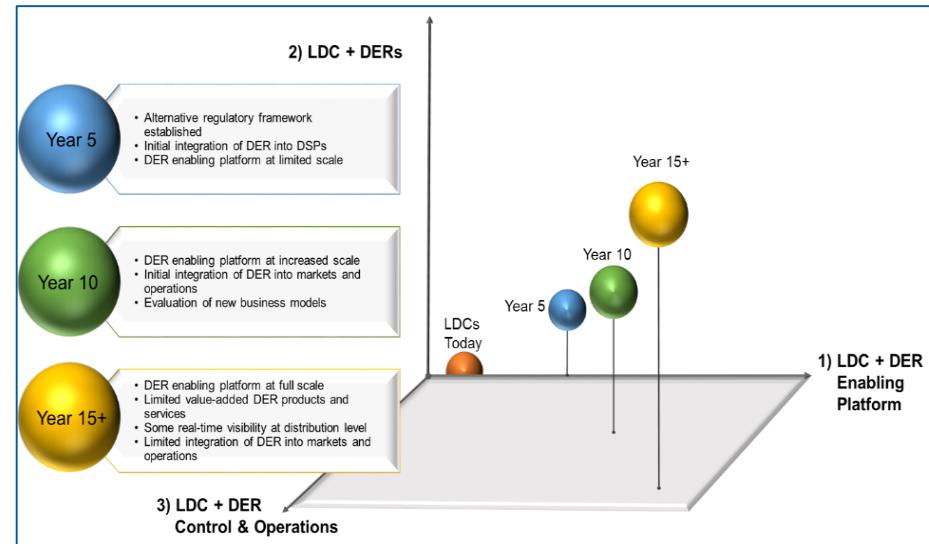
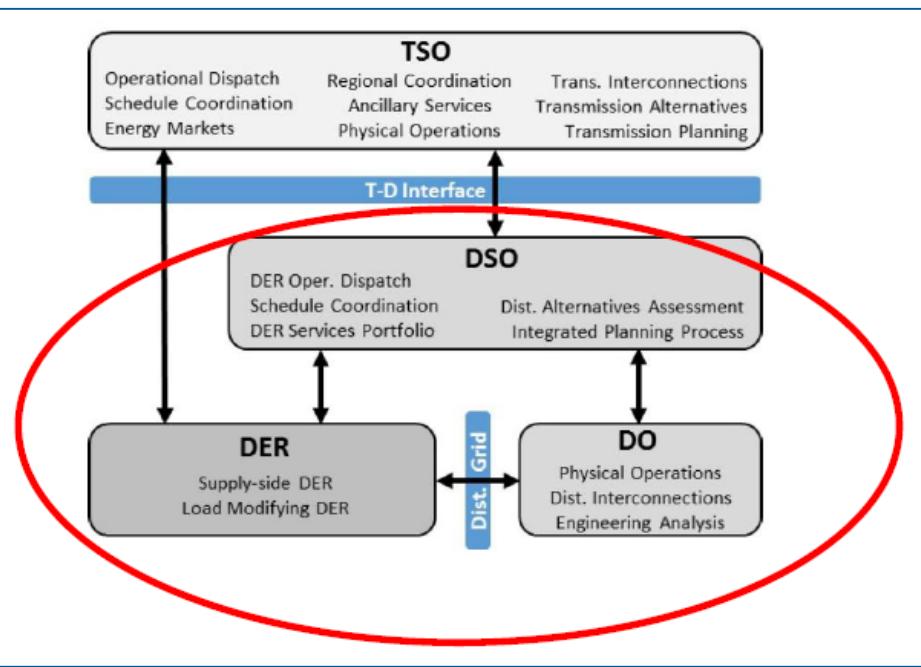
HOT TOPICS IN ONTARIO'S SECTOR

ACTIVE DIALOGUE AROUND THE SECTOR'S FUTURE

- Like many jurisdictions around the world, Ontario is in the midst of an active, dynamic dialogue regarding the transformation and future of its electricity sector
- Key factors driving transformation in the sector:
 - Evolving customer roles, preferences, choices, needs & expectations
 - Technological innovation and digitization
 - System changes due to integration of intermittent resources
 - Growing availability and penetration of distributed energy resources
 - Public policy (esp. in relation to GHG reduction/decarbonization)
 - Public concern regarding electricity costs (incl. in COVID context)
- The slides that follow summarize the major themes and areas of focus in discussions and activity across Ontario's sector



NEW CONCEPTUAL & BUSINESS MODELS FOR UTILITIES

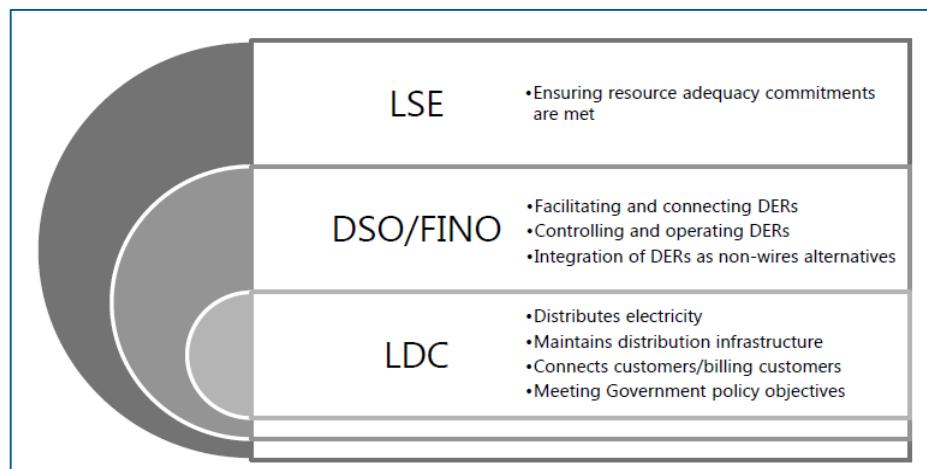


Source: Electricity Distributors Association

Source: IESO

Acronyms

- LSE = Load Serving Entity
- DSO = Distribution System Operator
- FINO = Fully Integrated Network Orchestrator



Source: Ontario Energy Association

DISTRIBUTED ENERGY RESOURCES (DERs) – CHALLENGES & OPPORTUNITIES

- Increased system operations flexibility
- System, regional, distribution planning
- Transmission-distribution interoperability
- Infrastructure deferral
- Reduced need for gas-fired generation
- Reliability benefits and impacts
- Customer choice and convenience
- System costs and benefits
- Utility ownership and control
- Access to DER operational data
- Pricing for DER energy and capacity
- Participation in wholesale markets
- Animation of distribution-level markets

Applicable Sector Initiatives
OEB <ul style="list-style-type: none">• Responding to DERs• Utility Remuneration• DER Connections Review• Regional Planning Process Review• Rate Design for Commercial & Industrial Electricity Customers• Innovation Sandbox
IESO <ul style="list-style-type: none">• Market Renewal Program• Capacity Auction• Resource Adequacy• Design for Energy Storage Participation• Regional Planning Review Process• Innovation and Sector Evolution White Paper Series• Energy Payments for Economic Activation of DR Resources• Energy Efficiency Auction Pilot• York Region Non-Wires Alternatives Demonstration Project

MARKET & REGULATORY MODERNIZATION

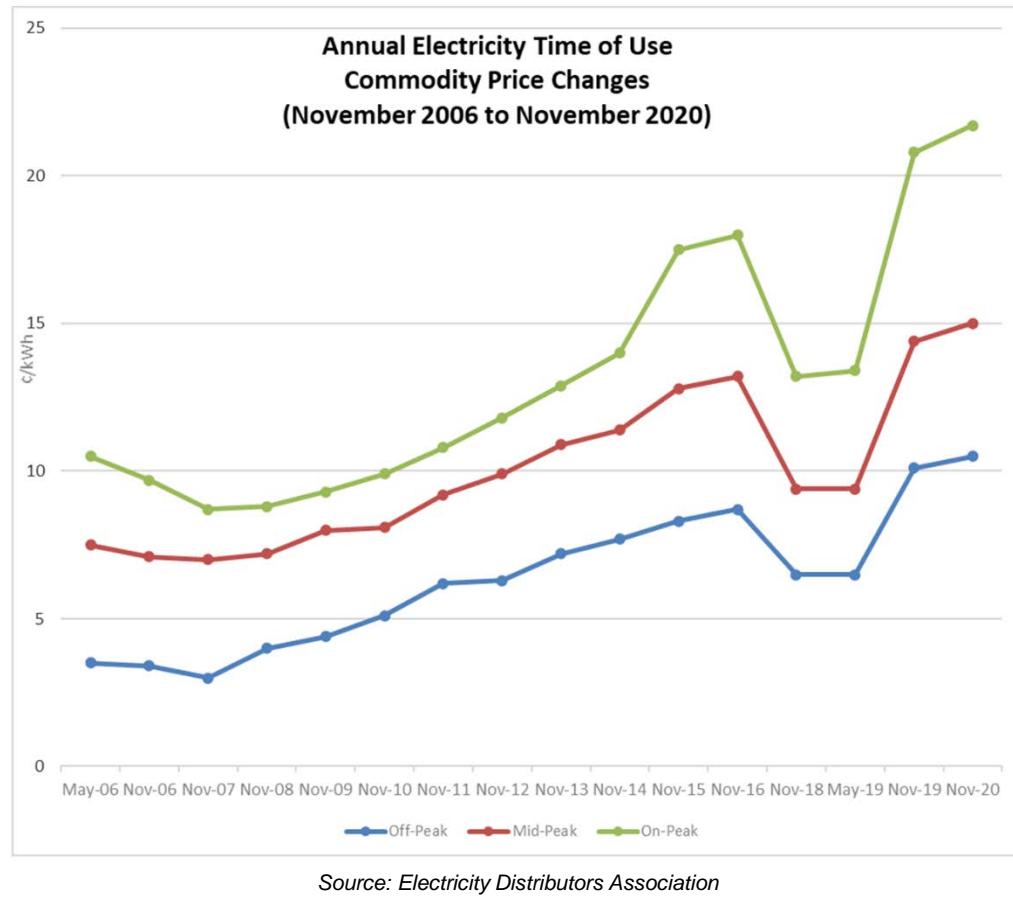


- Signature IESO initiative since launch in 2016
- Significant energy market redesign
- Complementary initiatives include inaugural capacity auction (Dec. 2020) and ongoing Resource Adequacy engagement examining new, competitive mechanisms for resource procurement
- Sustained emphasis on need for regulatory reform to keep pace with transformation in sector
- Predominant focus of late (2018-2020) was modernization of OEB governance and leadership structure
- Ministry of Energy is set to explore further changes to long-term energy planning process in coming months



COSTS, PRICES, RATES, \$\$\$

- In recent years, Ontario has witnessed heightened public concern regarding increases in the (commodity) costs of electricity
- Upwards pressure on cost was linked in large part to implementation of coal generation phase-out
 - New gas-fired capacity
 - Above-market contracts for large and micro renewables
 - Refurbishment of nuclear units
- Multiple rate mitigation and assistance programs since 2010
 - Rebates ranging from 10-30+%
- Current government campaigned on promise to lower bills by 12%
- Cost concerns expected to persist against COVID backdrop





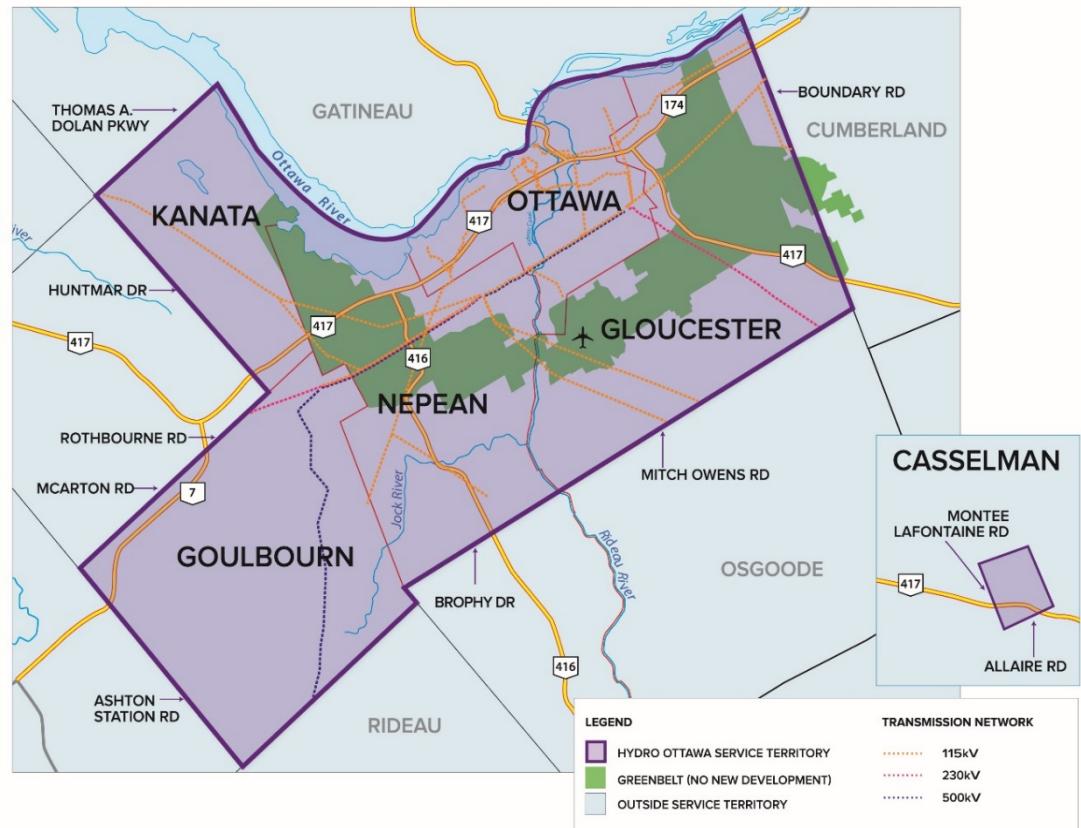
PROJECT MERLIN'S RELEVANCE IN AN ONTARIO CONTEXT

- As signalled in the preceding slides, the scope and objectives of Project MERLIN enjoy numerous points of intersection with issues with which Ontario's electricity sector is actively seized
- The slides that follow illustrate the nexus between MERLIN's areas of focus and on-the-ground circumstances in Ontario, using examples from Hydro Ottawa and the sector more broadly

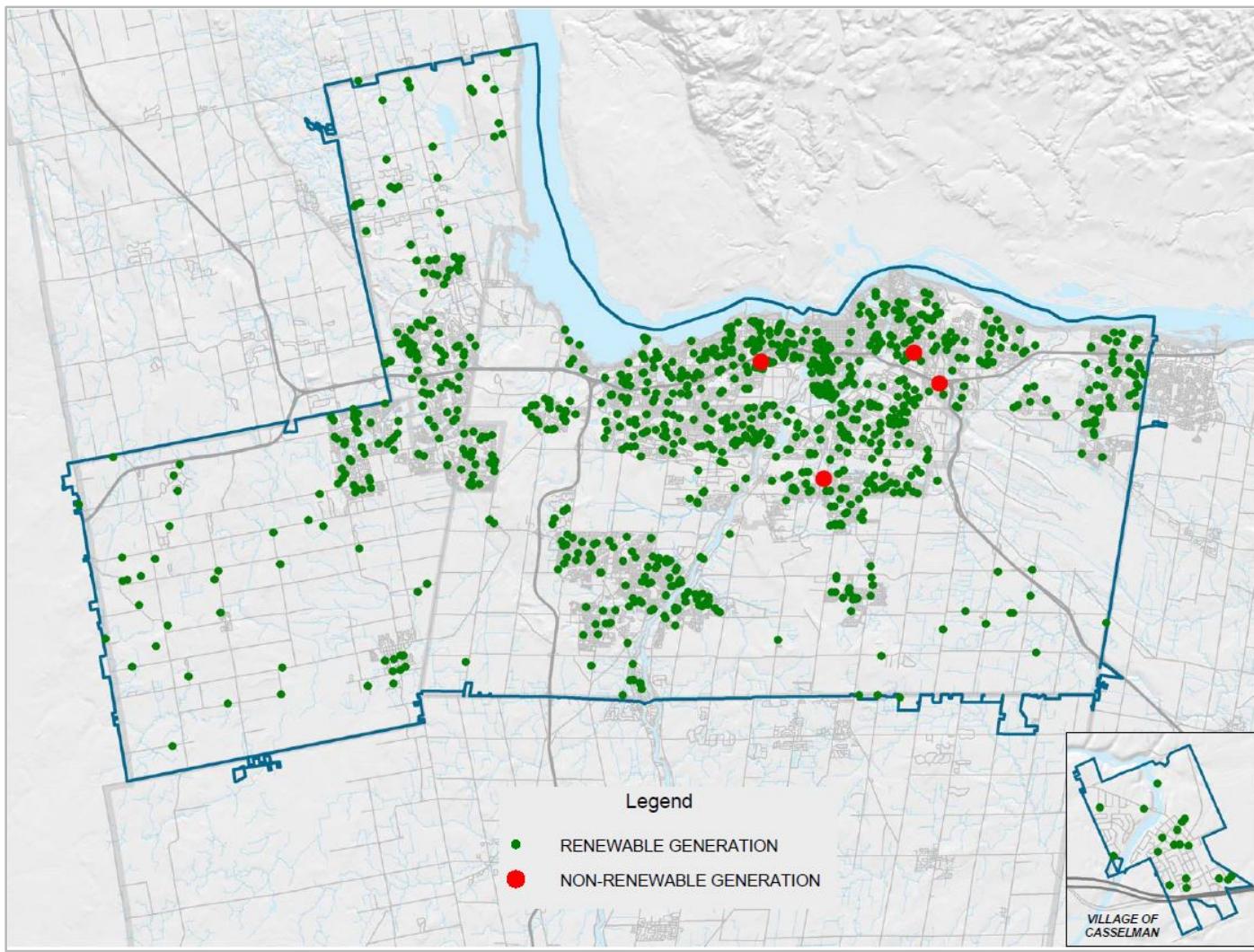


HYDRO OTTAWA – KEY DETAILS

- ~340,000 customers
 - 4,000-5,000 new connections per year; steady growth in Ottawa
- 1,116 km² service territory; 60% rural, 40% urban
- In recent years, average system summer peak = ~1.4 GW
- Following the Ontario government's decision to phase out coal generation, Hydro Ottawa connected the first wave of provincially-enabled embedded generation to its system in the mid-2000s



EMBEDDED GENERATION IN HYDRO OTTAWA's SERVICE TERRITORY (AS OF DEC. 31, 2018)



EMBEDDED GENERATION BY CATEGORY

Program / DSC Category	Large	Medium	Small	Micro	Total
	kW (qty)	kW (qty)	kW (qty)	kW (qty)	kW (qty)
Non-Renewable					
Battery-IESO		4,000 (1)			4,000 (1)
HOEP					
Standby		999 (1)			999 (1)
Load Displacement		21,578 (8)	500 (1)		22,075 (9)
Renewable					
FIT			15,017 (107)		15,017 (107)
HCI		18,780 (5)	465 (1)		19,245 (6)
HESOP	29,352 (1)				29,352 (1)
Load Displacement			997 (6)	5.5 (1)	1003 (7)
HOEP			28 (1)		28 (1)
RES		8,378 (2)			8,378 (2)
RESOP		10,000 (1)			10,000 (1)
MicroFIT				7,348 (880)	7,348 (880)
Net-Meter				183 (27)	183 (27)
Total	29,352 (1)	63,735 (18)	17,007 (116)	7,536 (908)	117,630 (1043)

REGIONAL PLANNING

- Since the inception of Ontario's regional planning process, there have been two planning cycles for the Ottawa area
- Consistent with regional planning requirements, each cycle has identified potential non-wires solutions to help address specific needs
- Major recommendation from 2015 regional plan was implementation of distributed generation (DG)
- As part of 2019-2020 cycle, decision was made to deploy non-wires solutions in Kanata North area to help defer need for new station infrastructure
- 2020 plan included assessment of non-wires options and triggered initiation of subsequent study focused on 115 kV system, with commitment to assess non-wires alternatives

OTTAWA AREA INTEGRATED REGIONAL RESOURCE PLAN

Part of the Greater Ottawa Planning Region | April 28, 2015



COMMENTS & OBSERVATIONS

- Hydro Ottawa:
 - has cultivated extensive experience in connecting, integrating, and planning for various types of DERs
 - affirms the value and benefits associated with DERs
 - views DERs as a critical and inevitable component of Ontario's smart energy future
- DERs have featured prominently in regional and system planning considerations
- Different customer subsets are interested in different DERs
- Hydro Ottawa believes that distribution utilities are uniquely positioned to leverage DERs for the overall benefit of the system and customers



COMMENTS & OBSERVATIONS (CONT'D)

- To date, the deployment of most types of DER in Ontario has relied heavily on provincial programs, innovation funds, and the net metering regulation's compensation regime
 - As noted on slide 26, there are 107 Feed-in-Tariff (FIT) and 880 MicroFIT resources in Hydro Ottawa's service area
 - IESO is counterparty to 33,375 FIT and MicroFIT contracts overall
 - **Many contracts begin to expire in mid/late 2020s; unclear how resources will be managed, leveraged, and optimized thereafter**
- Alternative costing and business models (whether market- or regulation-enabled) remain in a nascent state of development
- Both the OEB and IESO are actively exploring means for supporting greater deployment and utilization of DERs
- However, many issues are (i) unclear and/or (ii) contentious and don't enjoy widespread consensus amongst stakeholders

DER REGULATORY ISSUES FOR ONTARIO LDCs

LDC Obligations

- Recall that Ontario LDCs are not granted authority over resource adequacy or contracting for generation supply

Definition of “Distributed Energy Resource”

- There is no formal definition for DER under OEB regulation
 - Certain individual types of DER are defined; however, mostly in relation to generation (e.g. embedded generation facility)

Obligation to Connect Embedded Generators

- Under the OEB Distribution System Code (DSC), distributors are required to do the following:
 - Make all reasonable efforts to promptly connect a generation facility which has applied for connection
 - Within defined timelines: (i) conduct a Connection Impact Assessment (CIA) for facilities >10 kW; (ii) once CIA is complete, execute connection

DER REGULATORY ISSUES FOR ONTARIO LDCs (CONT'D)

Obligation to Connect Embedded Generators (cont'd)

- As part of the Connection Impact Assessment process, embedded generator applicants must provide certain data to LDCs:
 - Name-plate rated capacity
 - Fuel type and type of technology
 - Location of proposed facility
- However, once embedded generator is connected, there are no requirements under OEB regulation for the generator to provide operational data to the LDC
- As a result, the LDC lacks full visibility into the operational status of the embedded generator
- The DSC does not include analogous connection provisions for other DER types (e.g. storage, demand response)

DER REGULATORY ISSUES FOR ONTARIO LDCs (CONT'D)

Utility Ownership and Operation of DERs

- Ontario LDCs are permitted to own and operate DERs under limited, prescribed parameters:

DER Type	Applicable Provision
Renewable generation facility <10 MW	<i>OEB Act</i>
Renewable generation facility	Ontario Regulation 541/05 Net Metering
Renewable generation facility	Feed in Tariff program requirements
Cogeneration facility (power, thermal)	<i>OEB Act</i>
Energy storage facility	<i>OEB Act</i> , OEB Staff Bulletin on Energy Storage for Remediating Reliability
CDM, demand response, energy storage	OEB CDM Guidelines for Distributors
Electric vehicle charging infrastructure	OEB Staff Bulletin on EV Charging



DER REGULATORY ISSUES FOR ONTARIO LDCs (CONT'D)

Utility-Owned DERs – Funding/Revenue

- As a general matter, OEB regulation does **not** permit LDCs to (i) recover the costs of DER investments through rates, and/or (ii) include DER assets in rate base and thus earn a regulated return
- Limited exceptions:
 - OEB CDM Guidelines permit rate-funded DERs if investments defer distribution infrastructure
 - OEB may permit rate-funded DERs as part of an LDC's Distribution System Plan investments, if LDCs present evidence in support of their unique circumstances and the DERs serving a distribution function
 - August 2020 OEB staff bulletin stated that ownership and operation of behind-the-meter storage may be considered distribution activity (and thus eligible for rate funding) if it remediates customer reliability
- **The absence of a clear regulatory/revenue incentive for LDC investment in DERs has been a barrier to deployment**

DER REGULATORY ISSUES FOR ONTARIO LDCs (CONT'D)

Rate Design

- There is currently no specific rate class for DERs under OEB regulation

Regional Planning

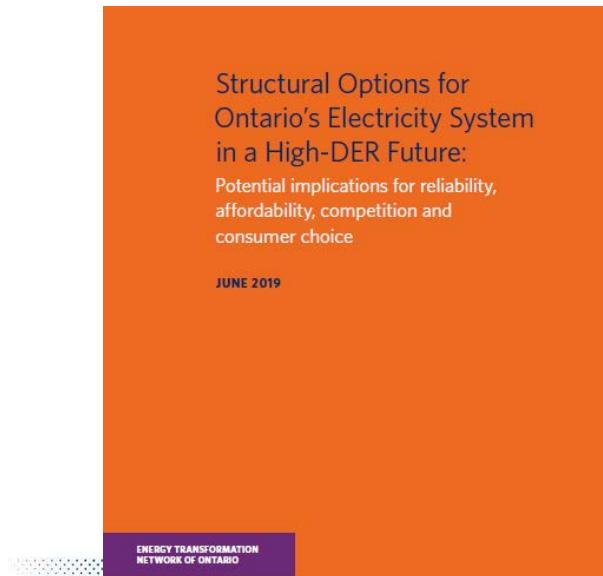
- OEB Transmission System Code assigns responsibility to IESO for leading the process to determine the appropriate mix of investments (CDM, generation, transmission, and/or distribution) in order to address regional electricity needs
- In practice, responsibilities for transmission and distribution investments have been clear; licensed transmitters and distributors have been able to execute effectively on directions issued by IESO
- However, responsibilities for non-wires investments have been much less clear; IESO lacks the authority/means to direct or compel such investments
- IESO recently undertook comprehensive review of regional planning process, including identification of barriers to greater deployment of non-wires solutions
 - Final report is set for imminent release; IESO, OEB to collaborate on implementation



DER MARKET ISSUES FOR ONTARIO LDCs

General Take-Aways

- As mentioned earlier, DER deployment in Ontario has relied on provincial programs, innovation funding, net metering
- IESO has signalled openness to DERs participating in both capacity and energy (real-time and day-ahead) markets
- However, exploration remains in preliminary stages; no firm timelines at present for proposals or action



Source: IESO



DER MARKET ISSUES FOR ONTARIO LDCs (CONT'D)

Definition of “Distributed Energy Resource”

- There is no formal DER definition under IESO Market Rules
 - Certain individual types of DERs are formally defined (e.g. storage, various forms of DR)
 - Working definition in IESO white papers:
 - DER (1) is directly connected to the distribution system, or indirectly connected to the distribution system behind a customer's meter; and (2) generates energy, stores energy, or controls load

Locational Marginal Pricing (LMP)

- In the current construct of the Ontario energy market, LMP is not employed for wholesale pricing purposes
 - Recall earlier discussion on slide 10 re: Hourly Ontario Energy Price
- However, IESO is planning to introduce LMP as part of its Market Renewal reforms

DER MARKET ISSUES FOR ONTARIO LDCs (CONT'D)

Distribution Locational Marginal Pricing (DLMP)

- As LMP is not employed in the wholesale pricing for energy in Ontario, it is likewise not employed at the distribution level
- In a May 2020 white paper on non-wire alternatives in energy and capacity markets, IESO explored the concept of DLMP
- Concepts explored in the IESO white paper included the following:
 - Determination of DLMP by the IESO itself as wholesale market administrator, or by distribution system operators (DSOs)
 - IESO-DSO coordination processes in relation to DER participation in capacity and energy (both real-time and day-ahead) markets
 - Market power
 - Cost allocation and rates



DER MARKET ISSUES FOR ONTARIO LDCs (CONT'D)

Distribution Locational Marginal Pricing (cont'd)

- IESO acknowledged that leveraging DERs at scale and introducing the DSO model may require fundamental changes to legislation, regulation, planning methods, market rules, and system operations
- IESO also suggested that one option for introducing opportunities to leverage DERs could be establishing distribution-level markets and prices in a few specific zones in a distribution system, where there are specific needs
 - Over time, these zones could grow in number and granularity



DER MARKET ISSUES FOR ONTARIO LDCs (CONT'D)

Distribution Locational Marginal Pricing (cont'd)

York Region Non-Wires Alternatives Demonstration Project

- IESO is currently testing some of the concepts discussed in its May 2020 white paper through a NWA demonstration project
- The project is focused on developing and testing the design of a distribution-level market administered by the local distribution company (Alectra Utilities) which procures energy and capacity from DERs as cost-effective alternatives to traditional distribution infrastructure
- The goal is to meet distribution needs while also enabling participation in the IESO market simultaneously
- In November 2020, IESO and Alectra administered a local capacity auction for a May-October 2021 commitment period
 - 10 MW cleared (7.1 MW of DR, 2.9 MW of gas-fired generation)



DER MARKET ISSUES FOR ONTARIO LDCs (CONT'D)

Demand Response

- From an IESO market perspective, the DER resource with the most maturity is demand response (DR)
- In 2015, IESO launched an annual DR auction
- In 2020, the DR auction was replaced and transitioned into new capacity auction
- As part of its Market Renewal Program, IESO has sought to implement a capacity auction as the preferred mechanism for procuring new capacity on competitive basis going forward
- Inaugural Ontario capacity auction was held in December 2020
 - Eligible resources were DR, generation, storage, imports
 - 80% of cleared resources were DR (including aggregations of DR at the residential level)

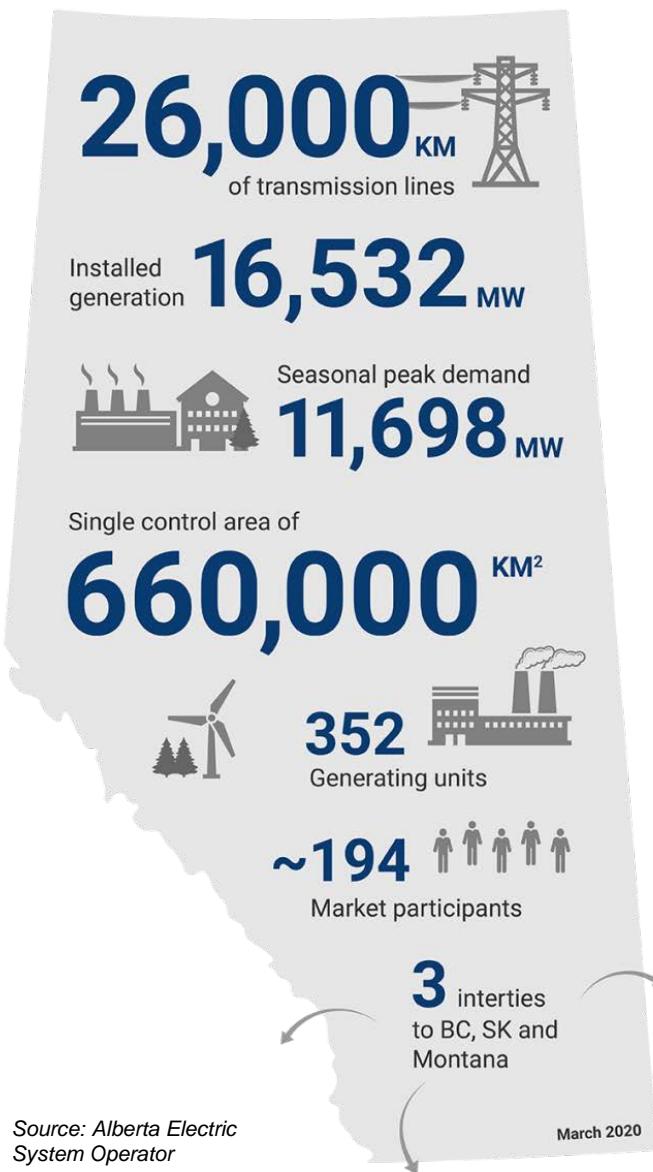


MERLIN & OTHER CANADIAN JURISDICTIONS

ALBERTA



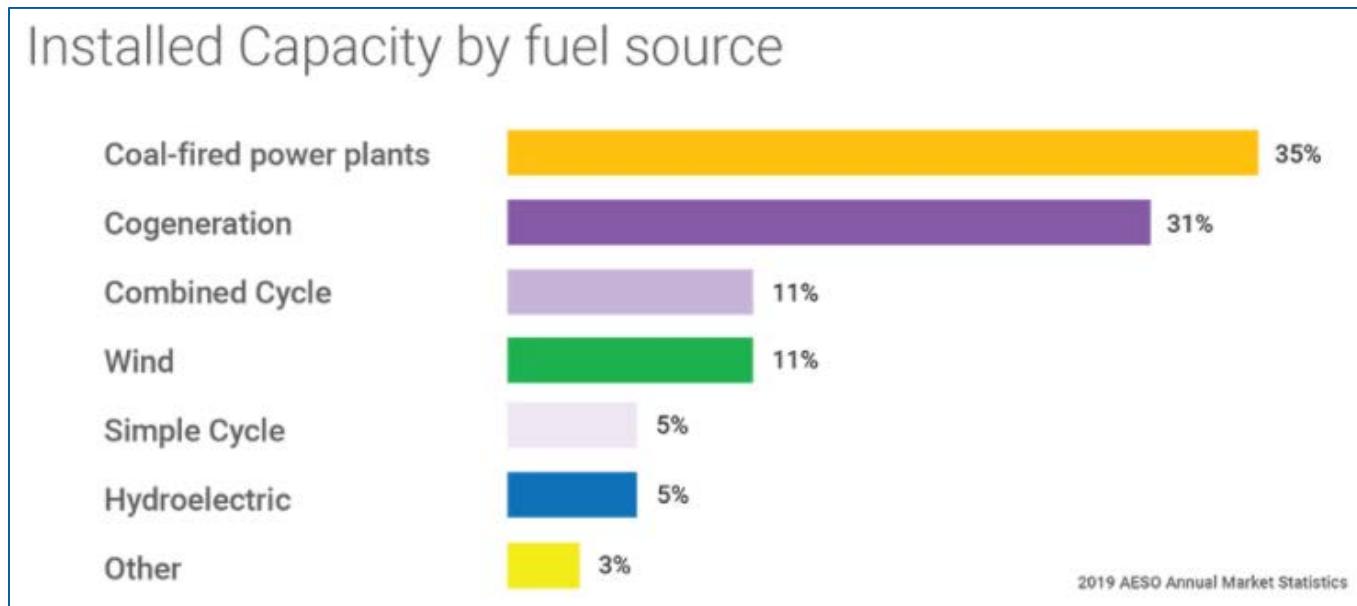
Alberta System Overview



ALBERTA

- **The only other Canadian province with a wholesale power market**
- Alberta's market uses an “energy-only” model – generators are only paid for the energy that they produce
 - In recent years, development of a capacity market was considered; however, a new provincial government scrapped the idea in 2019
- Similar to Ontario, Alberta's real-time energy market utilizes an hourly province-wide price
- For each hour of the day, the Alberta Electric System Operator (AESO) sorts supply offers and demand bids from the lowest to highest price
 - This establishes what is known as the “merit order”
- On a minute-by-minute basis, the last offer dispatched in the merit order to meet electricity demand sets the System Marginal Price (SMP)
- At the end of each hour, the average of all 60 SMPs is calculated and posted as the “pool price”, which is then used for settlement purposes
- **Alberta's pool price is province-wide; there is currently no LMP**

- Alberta's supply mix is one of the most carbon-intensive in Canada

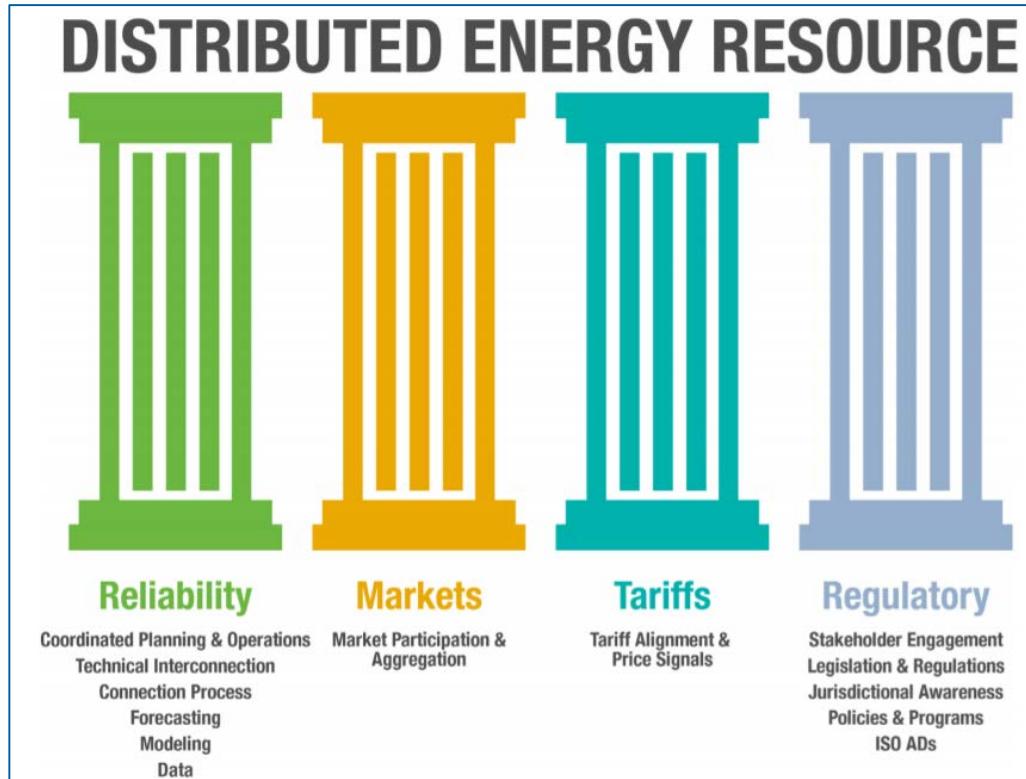


- However, supply will decarbonize, in accordance with federal rules mandating phase-out of traditional coal generation by 2030
 - Gas generation is expected to replace a major portion of the coal fleet
- Pursuant to government directives, AESO administered three competitive procurements for renewable energy in 2017 & 2018
 - However, no additional procurements currently planned

- In light of the decarbonization underway across the provincial grid, the AESO issued a “DER Roadmap” in June 2020
 - “Outlines a plan to proactively prepare the AESO for a future state characterized by a higher penetration of DER”
- Roadmap’s definition of DER: “any distribution-connected resource that can potentially supply energy to the electric distribution system”
 - I.e. distribution-connected generation and storage
 - Roadmap defines energy efficiency and demand response as “demand-side management resources”, not DER
- According to the AESO’s DER Roadmap, Alberta has 625 MW of distribution-connected generation
 - N.B. distribution-connected generation ≥ 5 MW must submit supply offers into AESO energy market



- The DER Roadmap organizes planned action into four categories:



- Reliability integration is the biggest area of focus
- Market-related actions are focused on maximizing the ability of DERs to participate in the AESO market (e.g. lower participation thresholds, more options for aggregation)

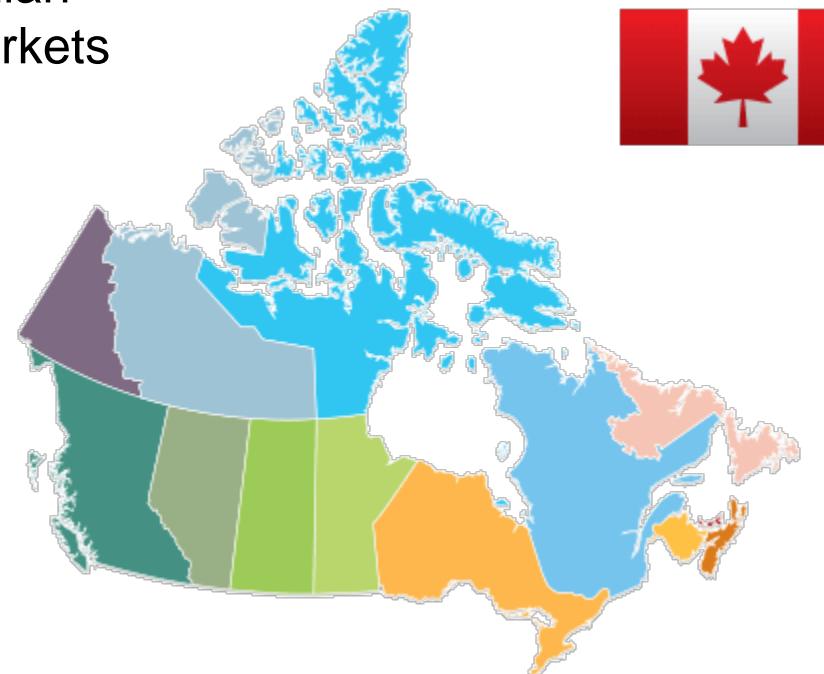


- The Alberta Utilities Commission (AUC) has also been actively examining issues related to DER penetration and integration
- In 2017, the AUC issued a report on matters relating to distribution-connected generation (e.g. system capability for accommodating future generation; regulatory and tariff barriers to deployment of additional generation; need for greater education and planning)
- In 2018, as a follow-up to its earlier review, the AUC initiated a Distribution System Inquiry
- The inquiry is focused on evolutions in market, technology, public policy, and consumer behaviour, and how regulation of the electricity distribution system should adapt in light of these trends
- **Stakeholders are currently awaiting issuance of the AUC's final report on the inquiry**



OTHER CANADIAN JURISDICTIONS

- Based upon the information presented in the foregoing slides, it's clear that the scope of Project MERLIN has relevance in the context of Ontario and Alberta's electricity market structures
- However, other Canadian provinces are not suitable case studies for applying the scope and goals of Project MERLIN
- Ontario and Alberta are the only Canadian jurisdictions with competitive power markets
- The electricity system for every other province is either exclusively or largely managed by a vertically-integrated utility, responsible for generation, transmission, and distribution



A blue-tinted photograph showing two people from the waist down, sitting at a table. One person is wearing a white shirt and the other is wearing a dark shirt. They are both looking at their laptops. On the table in front of them are several papers, a pen, and a small electronic device. The background is blurred.

Q & A

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