THE PUSH FOR ELECTRIFICATION AND A NET ZERO GRID – DEVELOPMENTS, REACTIONS AND IMPLICATIONS

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OSLER

Agenda

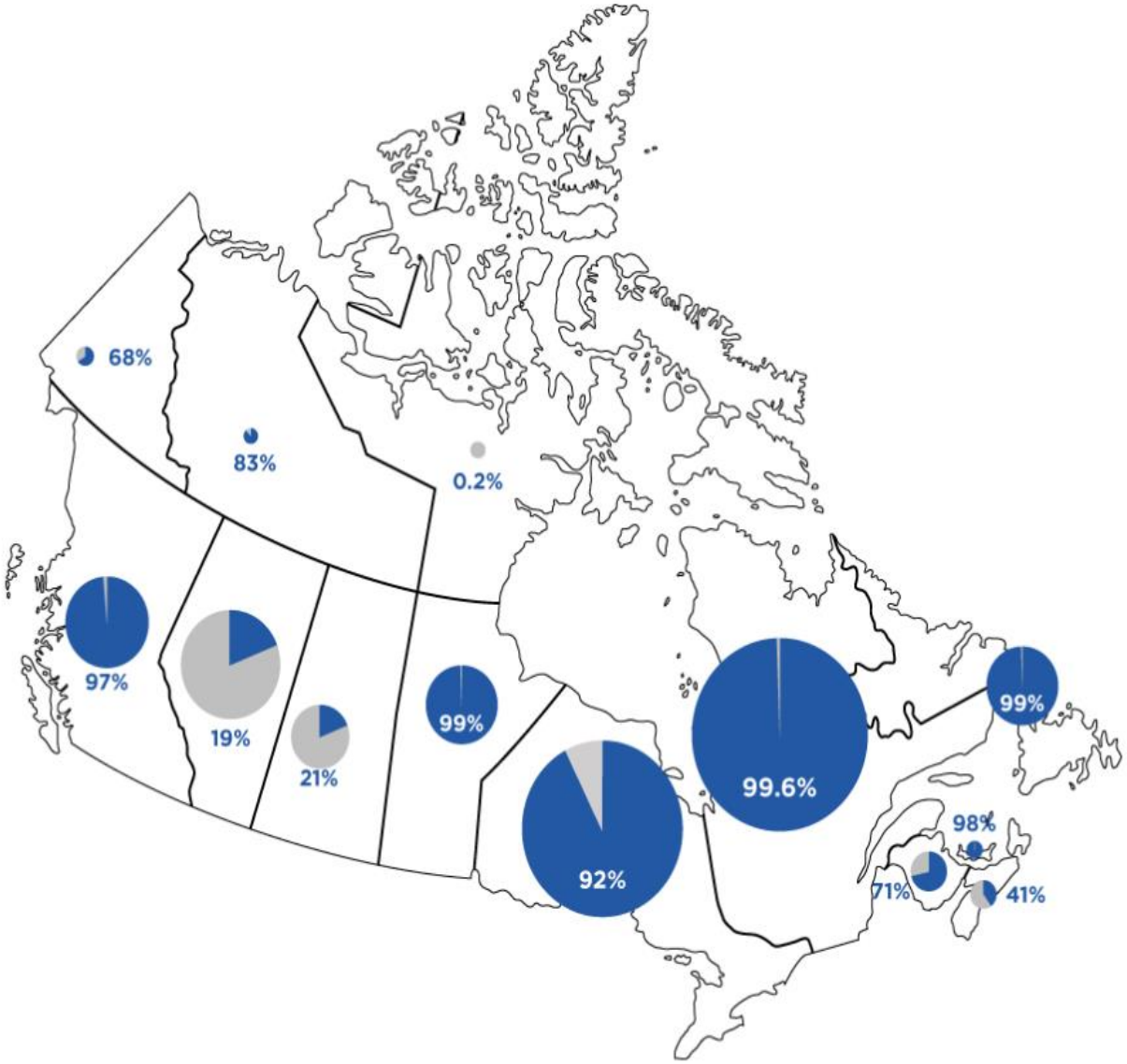
- Overview of the *Draft Clean Electricity Regulations* (“***Draft CERs***”)
- Supply Adequacy: Restructuring and Risk Allocation
- Managing Load: the Tension Between Increased Electrification and Scarcity of Supply
- Interprovincial Trade and Interties
- Regulatory Alignment, Affordability and Customer Choice
- Conclusion

Overview of the *Draft CERs*

Challenges for a One-Size Fits All Approach to Developing a Net-Zero Grid

Share of non-emitting electricity generation by province and territory, 2022

(Source: Clean Electricity Advisory Council Final Report, May 2024)



Where it started: the *Draft CERs*

- The Draft CERs are proposed to apply to electricity generating units that, on or after January 1, 2025:
    - have a generating capacity of 25 megawatts (MW) or more;
    - generate electricity using fossil fuel; and
    - are connected to an electricity system subject to the NERC standards.
- **Emissions Standard**: prohibit regulated generating units from emitting more than **30 tonnes of CO2 per GWh** of electricity generated on average in a calendar year commencing on January 1, 2035.
- Limited exemptions from the application of the Emissions Standard (no net exports, emergency circumstances, peaker exemption time and total emissions threshold)
- The January 1, 2035 date for compliance with the Emission Prohibition applies to units that combust coal and new units commissioned (or that increase their capacity by 10% or more) after January 1, 2025.
- For all other units, the Emissions Prohibition applies on January 1 of the year following the unit's *end of prescribed life* (the latter of December 31 of the calendar **year 20 years** after the commissioning date and December 31, 2034).
- The *Draft CERs* would make non-compliance with the Emission Prohibition an offence under the ***Canadian Environmental Protection Act, 1999*** punishable by fines from $100,000 to $12 million and potentially criminal penalties resulting even in incarceration.

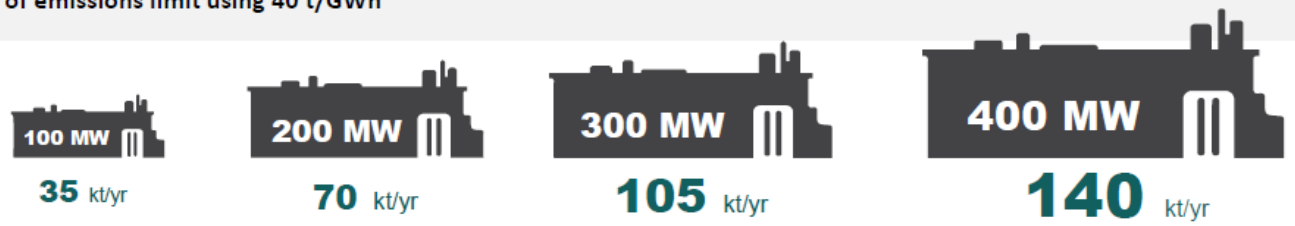
Where it's going: The Update to the *Draft CERs*

- On February 16, 2024, the Federal Government released a public update ("**Update**") outlining conceptual changes being *considered*
- Move from an emissions intensity standard that applies to all units to an annual emission limit tailored to each unit's capacity (ECCC, Updated on the Clean Electricity Regulations (CER) February 21, 2024)

This limit is like an allowance, rewarding efficiency by allowing more efficient units to operate more

Applicable performance standard (e.g., 40t/GWh)	x	*Size of unit* (MW)	x	8760 *hours/year* *(i.e., if it were to run 100% of the hours in a year)*	x	$\left(\frac{1\ GW}{1000\ MW}\right)$ *(a unit conversion)*	=	*Unit emission limit (tonnes)*
e.g., 40t/GWh	x	300 MW	x	8760 *hours/year*	x	$\frac{1\ GW}{1000\ MW}$	=	105 kt

Example of emissions limit using 40 t/GWh



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Where it's going: The Update to the *Draft CERs*

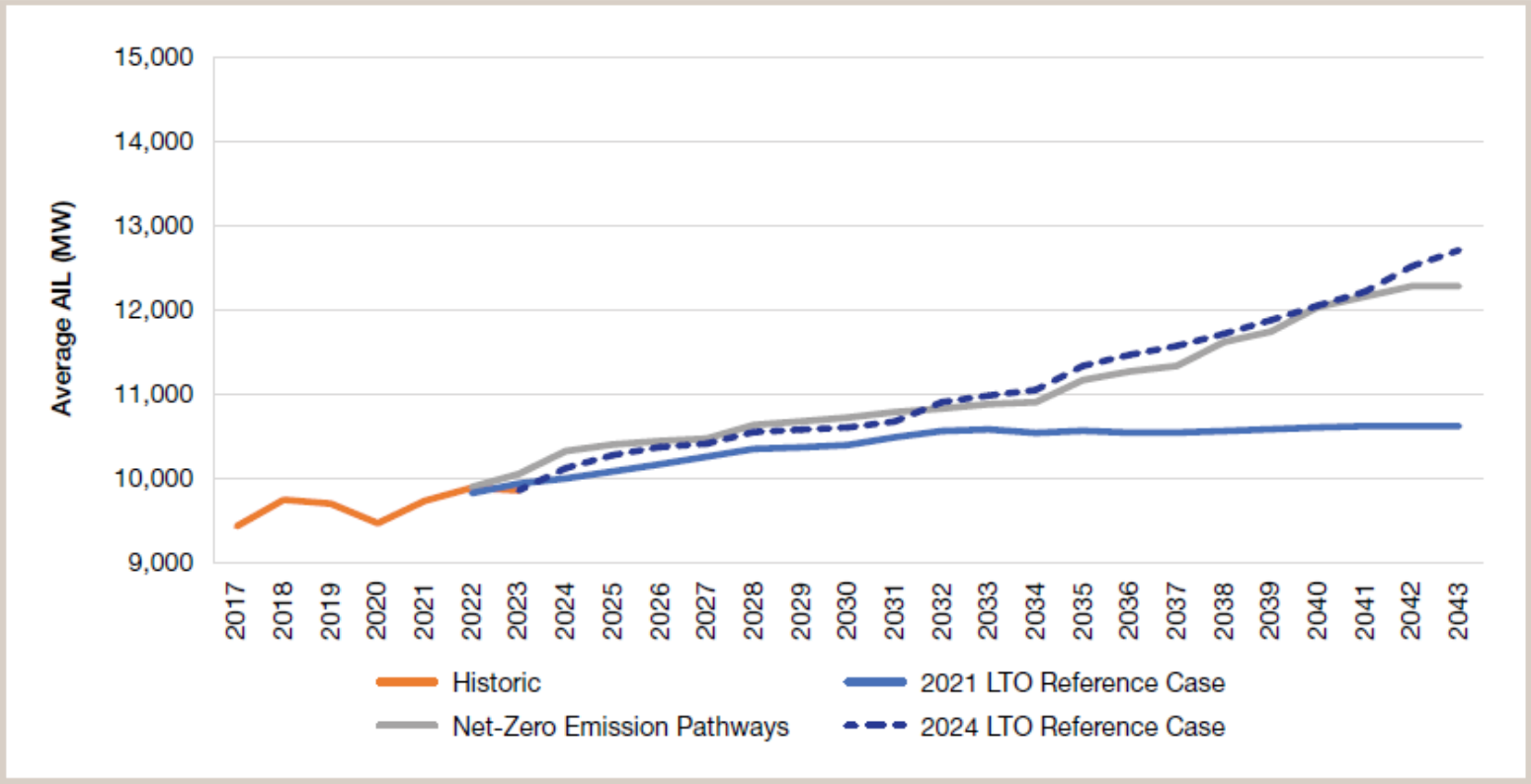
- The Final CER will prescribe an annual emissions limit not a performance standard that must be achieved.
    - For facilities that use CCS, the proposed annual emissions limit approach is intended to enable operators to adjust the operation of an emitting unit in various ways – e.g. reducing hours of operation, blending with low carbon fuels – to stay within the annual emissions limit.
- Offset credits eligible for compliance with the CER would be limited to those from the federal offset program and provincial offset programs recognized under section 78 of the federal *Output-Based Pricing System Regulations*.
- Consideration is being given to slightly extending the end of prescribed life.
- For existing units, consideration is being given to differentiating the treatment of emissions from electricity exported to the grid from "behind the fence" generation for a time-limited period.

Supply Adequacy: Restructuring and Risk Allocation

Supply Adequacy: Alberta

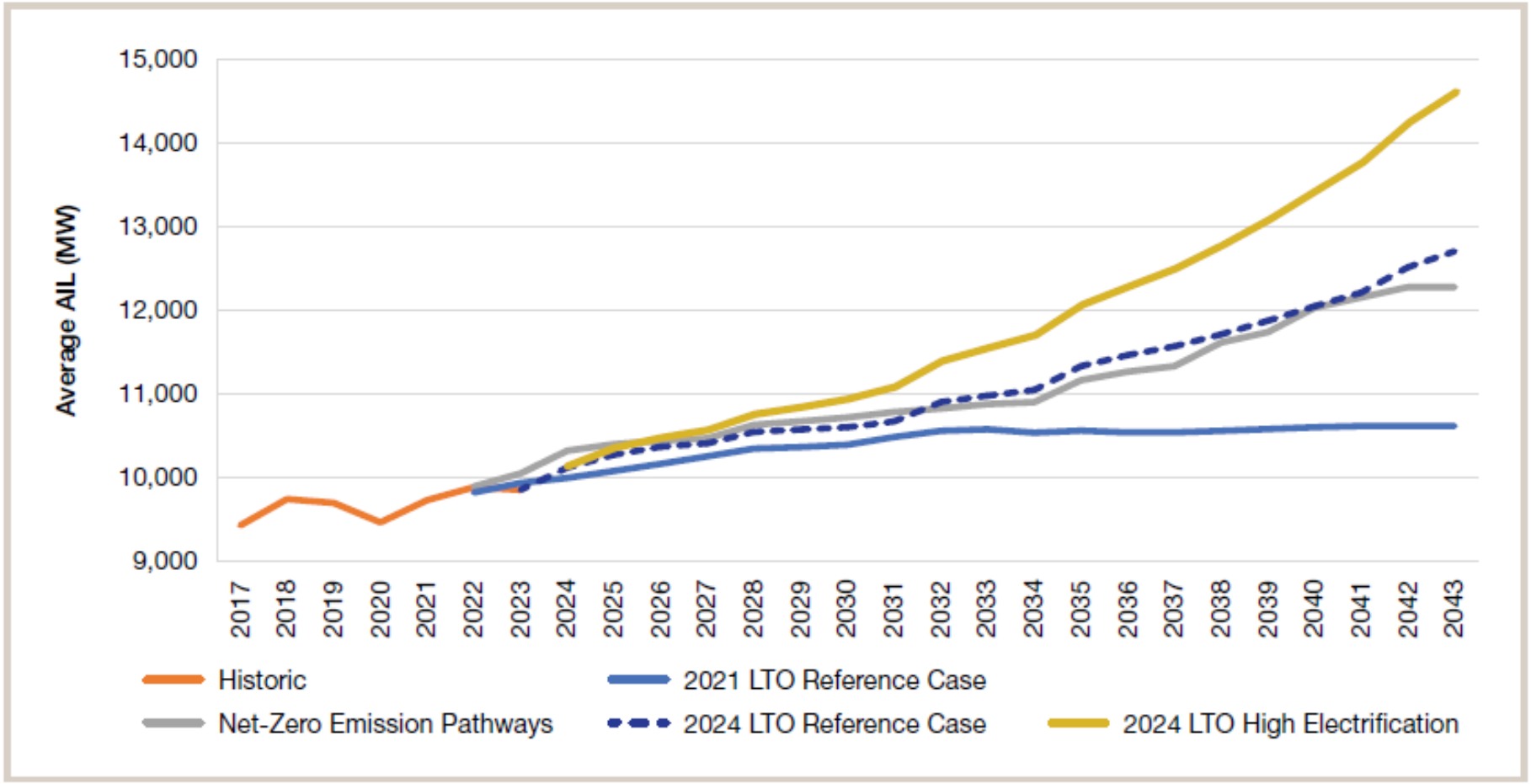
- The Alberta Electric System Operator ("**AESO**")'s 2024 Long-Term Outlook examines both projected load and projected generation

FIGURE 1: Reference Case – Average Alberta Internal Load (AIL) Forecast

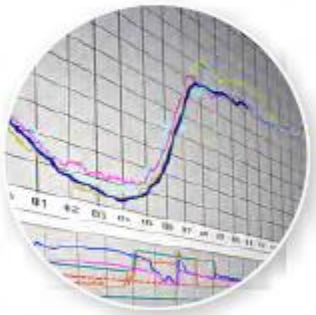


Supply Adequacy: Alberta

FIGURE 5: High Electrification – Average AIL Forecast



Supply Adequacy: Alberta

Reliability (2038 Expected Unserved Energy)	SCENARIO	Sustainability (Total Scenario Emissions for Entire Forecast)
4,400 MWh	 REFERENCE CASE	**107.8** Mt
173,686 MWh	 DECARBONIZATION BY 2035	**96.4** Mt

Supply Adequacy: Alberta's Restructured Energy Market

Options to illustrate possibilities: detailed consultation will fill out design details

Design Element	REM (Option 1)	REM (Option 2)	REM (Alternative)
Price setting	Marginal offer cleared plus administrative scarcity pricing adder in day-ahead and real time to both energy and remaining capability in supply cushion (i.e. those providing 'reserves')		Strategic Bidding (i.e. Economic Withholding), price set at cap when short of contingency reserves
Market power mitigation	Multiple of variable cost (~2x-4x) for mitigated entities	Lower offer cap of~$250-300/MWh for all entities (Intended to be less stringent than option 1)	Interim Mitigation Measures and slightly lower offer cap than current $1000/MWh
Energy price cap	~$3000/MWh	~$2000/MWh	~$3000/MWh
Price floor	Negative ~$100 /MWh		
Day-Ahead unit commitment design	Mandatory Day-Ahead Market		Day-ahead commitment process
Price setting with congestion	Uniform prices or locational prices with local market power mitigation in applicable areas		Uniform pricing with local market power mitigation in applicable areas

Supply Adequacy: Ontario Contracts for New Natural Gas

Ontario natural bas-fired procurement contracts include provisions addressing that, where laws or regulations are introduced and passed restricting GHG emissions from a project:

i. Require such projects to submit GHG emissions abatement plans, showing how the project will bring its operations into compliance with the laws or regulations, prior to the new emissions standards coming into force; and

ii. If a project is unable to comply with such laws or regulations in order to continue meeting its obligations under the Contract, despite commercially reasonable efforts, allow such project to suspend operations for the balance of the contract term while retaining payments under the Contract.

Managing Load: the Tension Between Increased Electrification and Scarcity of Supply

Managing Load: the Tension Between Increased Electrification and Scarcity of Supply

Act respecting the Régie de l'énergie, CQLR c R-6.01

76. The electric power distributor, municipal electric power systems ... are required to distribute electric power to every person who so requests within the territory where their exclusive rights obtain.

Managing Load: the Tension Between Increased Electrification and Scarcity of Supply

***An Act mainly to cap the indexation rate for Hydro-Québec domestic distribution rate prices and to further regulate the obligation to distribute electricity,* SQ 2023 c 1**

*10. … the obligation to distribute electric power set out in the first paragraph of section 76 of the Act respecting the Régie de l'énergie does not apply to any new request, any request for an additional load or any request from a customer having a special contract, which is for **5,000 kilowatts or more of power** ….*

*Where the obligation referred to in the first paragraph does not apply, a holder of exclusive rights must obtain the **authorization of the Minister** to distribute electric power to a person or class of persons at the applicable rate …*

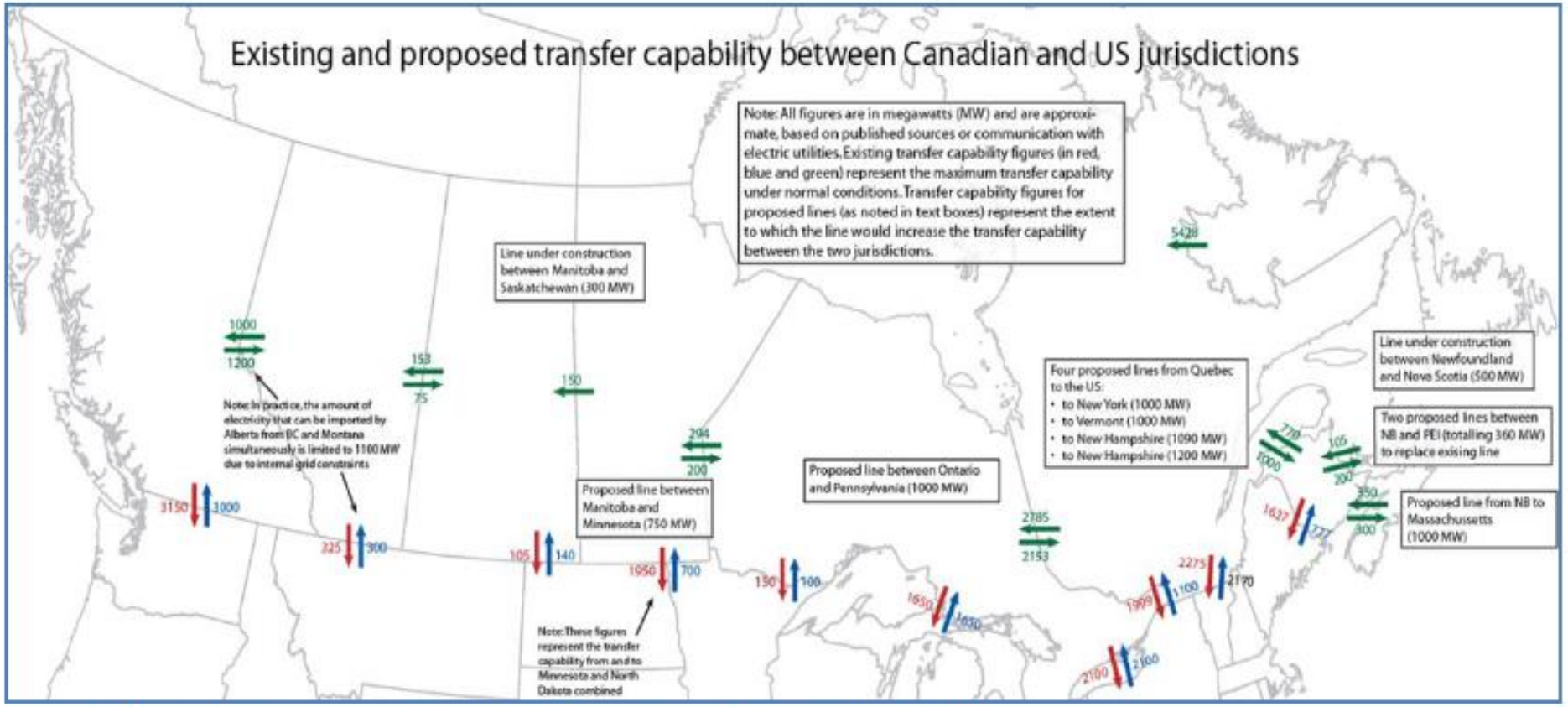
*Before issuing a distribution authorization, the Minister must take into account, among other things, the holder of exclusive rights' technical capabilities for connection as well as **the economic benefits and social and environmental impacts of the use of the electric power requested**.*

Interprovincial Trade and Interties

Interprovincial Trade and Interties

- According to the RIAS, the Draft CERs are expected to result in a significant increase to domestic electricity trade activity, facilitated by new provincial interties.
- However, provincial grids have historically evolved with limited consideration for inter-regional cooperation within Canada.
- Canadian provinces also have different priorities and export commitments regarding electricity supply.
- Atlantic Loop Example
    - In the fall of 2023, Nova Scotia abandoned the Atlantic Loop, which would have run more than 1,000 kilometres of transmission line from Quebec into New Brunswick and on to Nova Scotia to supply hydro electric energy from Quebec.
    - The Nova Scotia Government indicated that the project was no longer viable in light of ballooning costs, Quebec confirming that it does not have firm energy available for sale to meet Nova Scotia's winter peak needs, supply chain challenges and because "investing in our energy resources avoids Nova Scotian's having to spend billions on infrastructure in Quebec and New Brunswick."

Interprovincial Trade and Interties



Source: Natural Resources Canada, Submission, 20 September 2017.

Regulatory Alignment and Energy Transition

Regulatory Alignment and Energy Transition

- Ontario Energy Board, *Decision and Order – EB-2022-0200 – Enbridge Gas Inc. Application for 2024 Rates – Phase 1*
  - In 2022, Enbridge Gas Inc. ("Enbridge") filed an application with the OEB seeking approval of proposed changes to the rates Enbridge charges for natural gas service.
  - the OEB determined that for new connections for natural gas service, rather than a 40-year revenue horizon to calculate the economic feasibility of new connections, as historically had been the case, the recovery horizon should be 0 years, effectively directing that 100% of the connection costs would be paid upfront by the customer
  - The OEB found that the energy transition poses a risk that assets used to serve existing and new Enbridge customers would become stranded [i.e., retired early] because of gas customers leaving the gas system as they transition to electricity to meet energy needs previously met by natural gas.
- In response to the OEB decision, the Government of Ontario stepped in and recently passed the *Keeping Energy Costs Down Act, 2024* essentially over-turning the OEB's decision.

Affordability and Customer Choice

Affordability and Customer Choice

- Affordability
  - Calls for government funding to support decarbonization of the electricity grid to recognize that it is policy choices that are leading to the incurrence of significant costs in pursuit of broader social benefits from the decarbonized electricity system
  - Novel and flexible approaches to allocate and price costs related to decarbonizing generation, early retirements of emitting generation, and needed investments in transmission and distribution infrastructure
- Customer Choice
  - Consumers are looking for greater options to pursue affordability and decarbonized electricity for their own compliance and ESG goals
  - Greater flexibility allowing consumers to supply and secure their own electricity supply

Conclusion