

Canada – US Electricity Transmission

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1. Introduction: Our Clean Connections

The US and Canada electricity grids are connected by 31 transmission¹ interties that cross the Canada – US border from New England through to the Pacific Northwest. Every Canadian province that shares a border with the US has at least one US transmission interconnection.

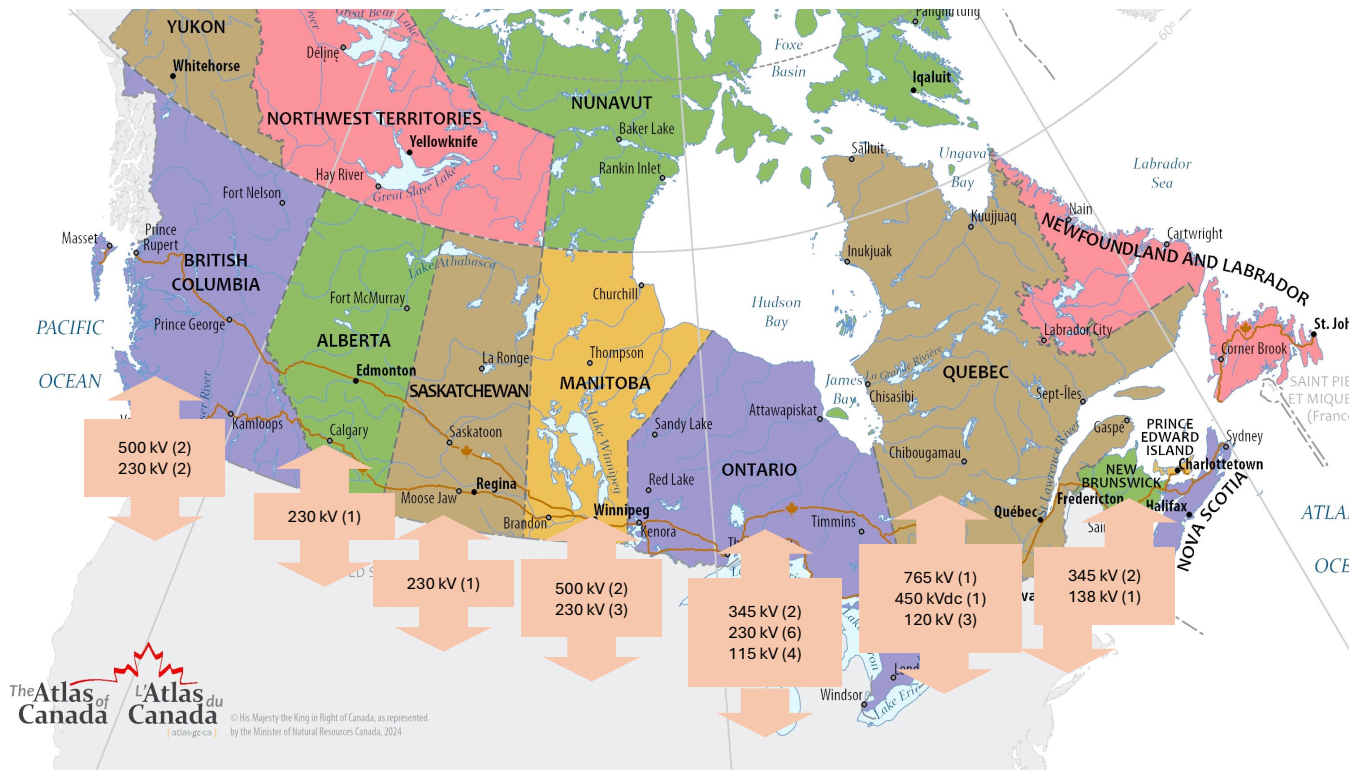


Figure 1 - Canada-US Transmission Interconnections, Canadian Energy Regulator, retrieved January 2025 (Operating Lines >= 100 kV)²

These international connections enable two-way energy trading, and provide enhanced reliability, reduced emissions, and economic benefits to customers on both sides of the border.

¹ Lines operating at 100 kV or greater, following the NERC Bulk Electric System definition

² International Power Lines Information - Open Government Portal

2. Enabling Trade

The international interconnections between Canada and the US have enabled substantial trade between the two countries. Between 2010 and 2024, Canadian exports averaged 59 terawatt-hours (TWh) and US exports averaged 13 TWh annually. For reference, Canada’s total electricity generation in 2023 was 615 TWh.³

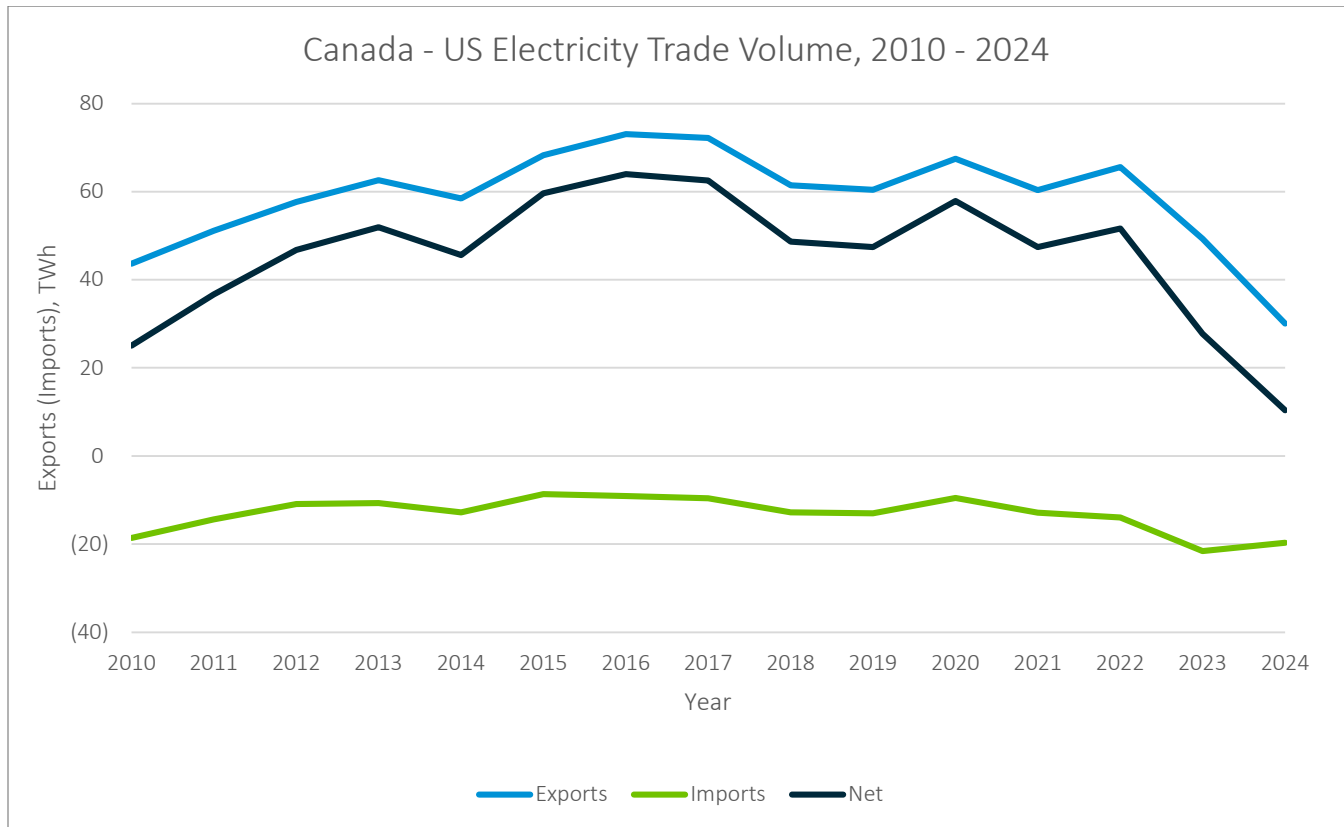


Figure 2: Canada - US Electricity Trade Volume, Canada Energy Regulator, Retrieved January 2025⁴

Canadian – US trade has developed over time primarily by hydroelectric producers with surplus energy beyond their domestic needs. This trade is also enabled by the seasonal difference in electricity demand between winter-peaking demand in Canada and by summer-peaking demand in the US. With lower domestic demand during the summer, Canadian operators have available generating capacity to power exports without compromising their ability to meet domestic needs.

US deliveries to Canada are also important when Canadian producers experience drought conditions and their hydroelectric generation is reduced, as can be seen in the import and export activity from beyond 2022 in Figure 2. Dry conditions in BC, Manitoba, and Québec contributed to reduced exports to the US and increased imports from the US during this period.

³ Electric power generation, monthly generation by type of electricity

⁴ CER – Electricity Trade Summary

While the revenue generated from electricity trade is not as significant as some energy sectors, the total value of electricity trade averaged almost \$4 billion per year Canadian over the 2010-24 period, and will increase as new projects are commissioned, as noted below.

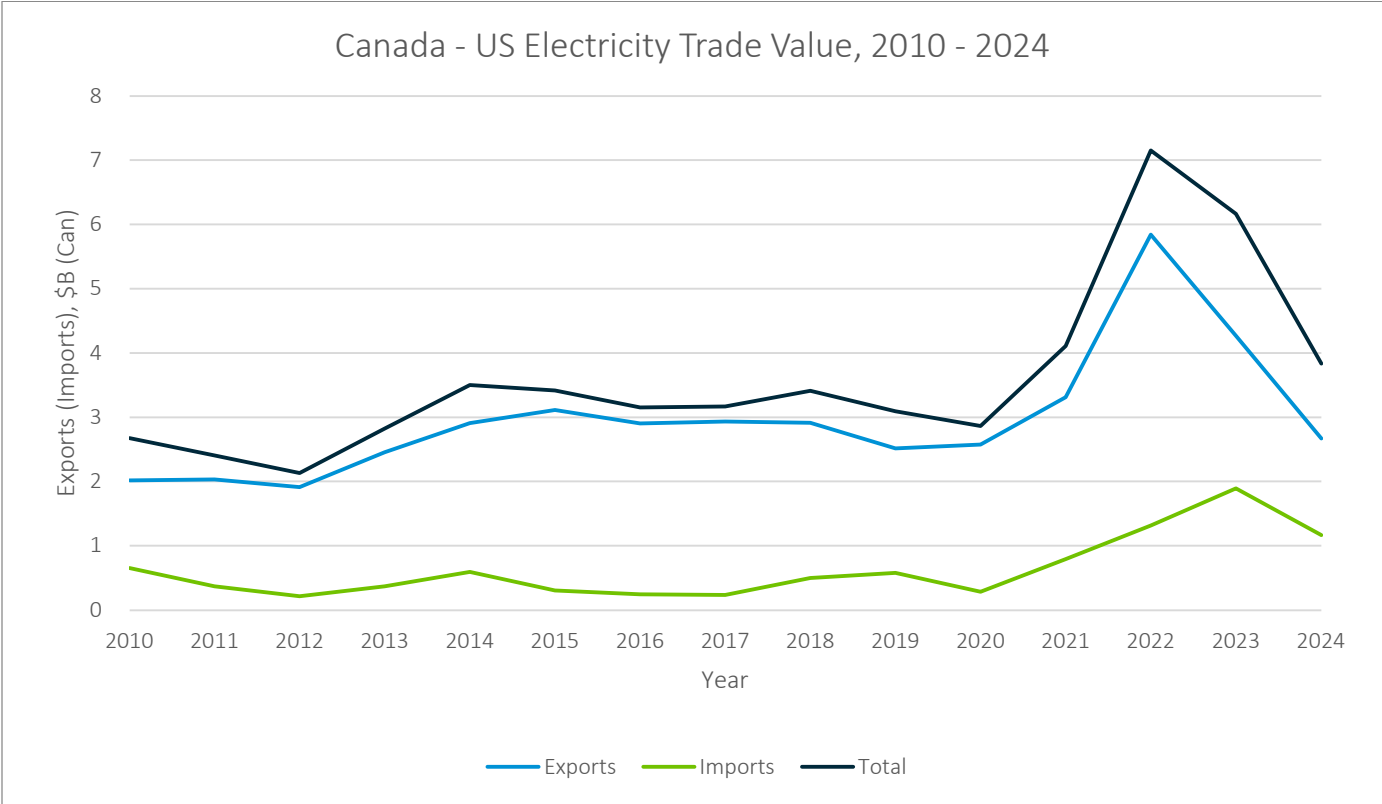


Figure 3: Canada - US Electricity Trade Value, Canada Energy Regulator, Retrieved January 2025⁵

3. Future Development

With the increased deployment of variable renewable energy sources, such as wind and solar, the importance of the interconnections between Canada and the US will be more important than ever. Generation surpluses and shortages can be balanced over a larger area with the interconnections in place, and the flexible long-term storage provided by Canada’s hydroelectric reservoirs will be an important asset to the North American electricity system.

SaskPower has applied to the Southwest Power Pool (SPP)⁶ to expand transmission capacity by 650 MW between Saskatchewan and the US. The new transmission line will enable greater deployment of variable renewables, improve reliability during unplanned events, and enable the development of new generation resources in Saskatchewan.

⁵ CER – Electricity Trade Summary

⁶ <https://www.saskpower.com/about-us/media-information/news-releases/2022/saskpower-seeking-to-expand-transmission-capacity-with-the-southwest-power-pool>

Hydro-Québec is undertaking two interconnection projects⁷ further connecting its system with New York and New England. The Hertel-New York interconnection will deliver hydropower to New York City, and the Appalaches-Maine interconnection will increase the power exchange capacity between Québec and New England.

These projects will increase bilateral trade, improve reliability and help jurisdictions meet their emission reduction targets for decades to come.

4. Summary

The transmission interconnections between Canada and the United States are significant. They have enabled bilateral trade between the two countries, and this trade has provided economic and reliability benefits on both sides of the border.

With the increased deployment of variable renewables, their benefits to both countries will be greater than ever.

References

“Clean Connection: Canadian and U.S. Electricity,” Center for Climate and Energy Solutions, May 2021

⁷ <https://www.hydroquebec.com/projects/#!?keywords=transmission>