



# Study of Canada's Exports of Environmental and Clean Technology Goods and Services

Submission by  
WaterPower Canada to the  
House of Commons  
Standing Committee on  
International Trade

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The Honourable Judy A. Sgro  
Chair, Standing Committee on International Trade  
*Submitted electronically by Web Form*

May 14, 2021

Dear Ms. Sgro,

**Re: Study of Canada's Exports of Environmental and Clean Technology Goods and Services**

WaterPower Canada (WPC) is the national trade association that speaks for the Canadian hydropower industry. WPC members are hydroelectricity producers, and their suppliers of goods and services. WPC submits this brief to the House of Commons Standing Committee on International Trade (CIIT) in support of the study on Canadian exportation of green, clean and low-carbon technologies that includes *"an examination on how Canadian clean technology such as hydroelectricity... can impact an ever evolving international markets"*.

Hydropower is a significant advantage for Canada's future economic competitiveness. Our abundance of hydroelectricity makes Canada amongst the countries best positioned to approach 90% non-emitting electricity in the coming decade. This clean electricity supply will play a significant role directly supporting increased climate ambition in Canada and the U.S. It can also minimize the greenhouse gas emissions intensity of many of our exported products and services, improving their competitiveness in a carbon-constrained world. It would be very well received by our sector if this was reflected in the Committee's final report. We present the following facts to support the Committee's understanding of hydroelectricity exports from Canada to the US:

**1. The U.S.' electricity sector accounts for approximately 25% of their total annual greenhouse gas emissions (more than 1,600 Mt CO<sub>2</sub>e/year)[1]. This volume of emissions is equivalent to more than double the total Canadian economy-wide emissions (730 Mt/year)[2]. President Biden has committed to achieving "50-52% economy-wide emissions reductions below 2005 levels by 2030"[3], and a "carbon pollution-free electricity sector no later than 2035"[4]. Realizing these outcomes would significantly increase demand for non-emitting electricity in the U.S.**

**2. Electricity trade between neighbouring regions typically yields multiple advantages, including improved resilience and reliability during periods of high demand or extreme-weather events, and greater affordability. The Canadian and U.S. electricity systems are highly integrated. In 2020, electricity imports (predominantly hydroelectricity) to the U.S. from Canada were of a volume equivalent to 1.8% of total US electricity consumption (67.2 TWh), representing an export sales value of \$2.6 billion CAD[5],[6]. During the same period Canada imported 9.8 TWh from the U.S.**

**3. Specifically, Canada's electric grid offers several advantages to the U.S. including affordability, flexibility and dependability, because 60 per cent of our annual electricity production is from clean and renewable hydropower.**

**3.1. Importing Canadian electricity offers a clear economic benefit to our southern neighbour. For example, the United States International Trade Commission recently concluded that owing to Canadian hydropower, Massachusetts can meet its new long-term renewable and clean-energy commitments with relatively modest increases in retail electricity rates. Canadian electricity imports can, the commission said, "help stabilize electricity prices, reduce costs to consumers, and make variable renewable energy (such as wind and solar) more profitable"[7].**

[1] United States (2021) "National Inventory Report"

[2] Canada (2021) "National Inventory Report"

[3] United States of America (2021) "Nationally Determined Contribution"

[4] Executive Order on Tackling the Climate Crisis at Home and Abroad

[5] United States Energy Information Administrator

[6] Canada Energy Regulator

[7] United States International Trade Commission (2021) "Renewable Electricity: Potential Economic Effects of Increased Commitments in Massachusetts"

**3.2. Consumer electricity demand constantly fluctuates. Similarly, the output from renewable energy resources such as wind and solar varies according to weather conditions. By adjusting the quantity of water flowing into hydropower turbines, producers can rapidly ramp up or down as needed to flexibly balance supply with demand.**

**3.3. The vast quantities of water stored in Canada's reservoirs – or flowing in waterways – represents this country's largest source of energy storage. Generators currently store water to meet peak demand; some reservoirs can even store water from one year to the next. With improved cross-border links, Americans can access this enormous liquid battery in moments and in a crisis.**

**4. Prime Minister Trudeau and President Biden have “agreed to take a coordinated approach to accelerating progress towards sustainable, resilient, and clean energy infrastructure, including encouraging the development of cross-border clean electricity transmission” [8]. Recently completed transmission projects such as the Manitoba–Minnesota Transmission Project, and others that are under development between Québec and Maine (known in the U.S. as the New England Clean Energy Connect), and the Champlain Hudson Power Express are essential to maximize the mutual benefits of regional electricity collaboration between the U.S. and Canada.**

**5. In addition to the availability of transmission capacity, the potential to grow hydroelectricity exports to the U.S. depends on continued investment in the: operation and maintenance of existing hydropower generation stations; creating efficiency enhancements and generation capacity additions during the refurbishment and redevelopment of existing units and sites; and the development of new hydropower generation projects. These investments are enabled by stable, long-term climate policies that shift investment toward non-emitting energy resources, and environmental and commercial regulations that provide streamlined processes and compliance certainty. Examples of commercial regulations that are a priority for modernization to better enable clean electricity collaboration between Canada and the U.S. would include the Canada Energy Regulator Export and Import Regulatory Framework.**

Additional background on the Canada-U.S. electricity relationship can be found in the Appendix. We thank the Committee for the opportunity to provide this submission, outlining the fundamental and growing importance of Canadian hydroelectricity as a leading clean technology export, and would be happy to provide any additional context that may be helpful.

Best regards,



Patrick Bateman  
Interim President, WaterPower Canada

CC:  
Christine Lafrance, Clerk, Standing Committee on International Trade

[8] <https://pm.gc.ca/en/news/statements/2021/02/23/roadmap-renewed-us-canada-partnership>

## Appendix

### **1. The Canadian and United States electricity systems are highly integrated.**

**1.1.** Canada-U.S. electricity trade dates back more than 100 years, reflecting and shaping a pattern of continental grid development in which interconnectivity is often more robust north-south than it is east-west. Today, more than 35 high-voltage transmission lines cross the border, and every Canadian province is thereby connected with at least one of the some 30 U.S. states that engage in electricity trade with Canada. While Canada is a net-exporter of electricity, the trade is two-way. Canadian exports to the U.S. remain modest within the overall scope of U.S. electricity supply, they make up material components in specific states and regions. In New York and New England, for example, Canadian electricity accounts for 12 to 16 per cent of retail sales.

**1.2.** The long-standing and growing importance of cross-border electricity trade is reflected in its entrenchment within successive trade agreements between the two countries, including its tariff-free treatment under the current Canada- United States-Mexico Agreement (CUSMA). Electricity trade is facilitated by adherence to common operational and commercial rules and standards, such as those developed by the North American Electric Reliability Corporation (NERC), and by collaborative efforts on cyber-security. In the Roadmap for a Renewed U.S. Canada Partnership<sup>[9]</sup>, Prime Minister Trudeau and President Biden *“recognized the important economic and energy security benefits of the bilateral energy relationship and its highly integrated infrastructure”*. Furthermore, that *“Canada and the US will increase cooperation to strengthen cybersecurity, and to confront foreign interference and disinformation. As part of their efforts to protect critical infrastructure in North America, the two countries will implement a Framework for Collaboration on Cybersecurity in the Energy Sector to enhance the security and resiliency of our cross-border energy infrastructure”*.

### **2. Integration with the Canadian electricity system offers unique benefits to the U.S. due to our abundance of hydropower.**

**2.1.** The United States is clearly on track to become a larger importer of Canadian electricity, with some particular reliance on source jurisdictions where hydroelectricity is the predominant form of generation. The value proposition for it in doing so is compelling, as hydroelectricity provides dispatchable generation that is highly flexible and reliable. Reservoir-based hydroelectric projects also have among the lowest average levelized costs of any source of electricity supply, and exports from Canada have already yielded significant cost savings for U.S. consumers.

**2.2.** With abundant fresh water and an extensive existing hydroelectric generating fleet, Canada can ramp generation up and down within short timeframes and in response to variations in both demand and availability of other forms of generation. Hydroelectric reservoirs - Canada’s “blue battery” - are a proven form of energy storage – unparalleled in scale and duration – and have significant potential to complement and balance U.S. renewable projects – such as from wind and solar energy. These resources could work together to form a clean energy system that remains reliable and resilient.

**2.3.** As an enhanced cross-border network of transmission interconnections takes shape in North America, both trading partners will benefit from the added flexibility of balancing supply and demand over larger areas and varying demand conditions. We will be able to better optimize all forms of generation, utilize what would otherwise be wasted capacity at times of localized low-demand, and moderate the need to build new capacity to meet localized peak-demand. Opportunities will also arise to leverage complementary variations across time zones and in seasonal demand peaks. Improved grid stability – and therefore reliability for all participants – is also an inherent outcome of wider integration, and is an increasingly important benefit as extreme weather events occur more frequently.

[9] <https://pm.gc.ca/en/news/statements/2021/02/23/roadmap-renewed-us-canada-partnership>

### **3. Canadian hydroelectricity can be a significant part of the solutions to achieve increased climate ambition in the U.S.**

- 3.1.** The United States is now re-engaged in global efforts to address climate change, and has set an aggressive target of 100 percent clean power by 2035. This will further accelerate export opportunities for Canadian power from clean sources such as hydroelectricity, building on the momentum generated by existing state-level efforts. Massachusetts, for example, has recognized the necessity of increased Canadian electricity imports to enable achievement of its statutory goal of cutting carbon dioxide emissions by 80 per cent by mid-century, particularly in light of the recent closure of nuclear generating capacity.
- 3.2.** Two key factors come into play in this regard: the need to continue to transition to what is likely to be a diverse mix of low- and non-emitting electricity sources, combined with the need to meet what is expected to be sharply rising overall demand as personal transportation, building heating and other end-uses are increasingly electrified. Hydroelectricity is internationally recognized as a renewable source itself, with ultra-low lifecycle greenhouse gas emissions that diminish over time. As noted, it will also play a key balancing role in facilitating full utilization of other renewable sources. Hydroelectricity capacity can be held back (or even augmented through storage) at times of high availability of wind and solar, while providing a reliable alternative at times of low availability from such sources.
- 3.3.** Models of highly synergistic cross-border electricity trade already exist.
- 3.3.1.** A 2011 power purchase agreement between Manitoba Hydro and Minnesota Power, for example, provided access to Canadian hydroelectric generating capacity, and included a storage provision, pursuant to which power from North Dakota wind farms is exported to Manitoba when in surplus.
- 3.3.2.** On May 12, 2021, *“Hydro-Québec and Transmission Developers, Inc. proposed generation and transmission solutions that will help New York State meet its renewable energy and climate emissions reduction goals by supplying New York City with clean power from Upstate New York and from Canada, delivered over a new transmission line. Delivering base-load clean power from Hydro-Québec and Upstate renewables into NYC can reduce fossil-fuel use and provide a flexible energy resource that can maximize New York’s ability to efficiently integrate the planned development of offshore wind. Over the long-term, Hydro-Québec’s existing hydropower system can act as a natural battery to complement New York’s future buildouts of local renewables such as Upstate wind, solar and offshore wind”*[10].
- 3.4.** Such arrangements have the potential to advance decarbonization on both sides of the border, and could become more common within the context of increased inter-regional and cross-border electricity trade in North America. Absent such an increase, neither Canada nor the U.S. is likely to reach its clean-electricity targets.
- 3.5.** In the Roadmap for a Renewed U.S. Canada Partnership[11], Prime Minister Trudeau and President Biden *“agreed to renew and update the existing Memorandum of Understanding (MOU) on energy between the U.S. Department of Energy and the Department of Natural Resources Canada to enhance cooperation on sustainable and equitable energy transitions, clean energy innovation, connectivity and low-carbon transportation”*.

[10] <https://news.hydroquebec.com/en/press-releases/1713/leading-energy-companies-partner-to-propose-hydro-upstate-ny-renewable-solutions-and-green-job-creation-for-new-york/?fromSearch=1>

[11] <https://pm.gc.ca/en/news/statements/2021/02/23/roadmap-renewed-us-canada-partnership>