

ROBERT F. MCCULLOUGH, JR.  
PRINCIPAL

## ***New England Clean Energy Connect (NECEC) Scheduling Interruptions and Net U.S. Exports to Quebec***

Robert McCullough  
Joshua Crawford  
McCullough Research  
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The famous economist, Thorsten Veblen, once remarked that theories can constrain how we see the underlying facts. This is scarcely truer than when analyzing energy trading and deliveries between Canada and the United States. Data formats, transparency, and operations are vastly different between Quebec’s provincial utility and its trading partners – primarily ISO NE and the New York ISO in the United States and Ontario in Canada.

In January 2026, Hydro-Quebec’s loads were very close to their forecasts, but they faced constraints in both capacity – the ability to generate electricity – and energy – the product actually used by consumers. The drought significantly reduced the fuel source for the vast majority of Quebec generation. The duration of the drought had drawn down reservoirs reducing their operating flexibility.

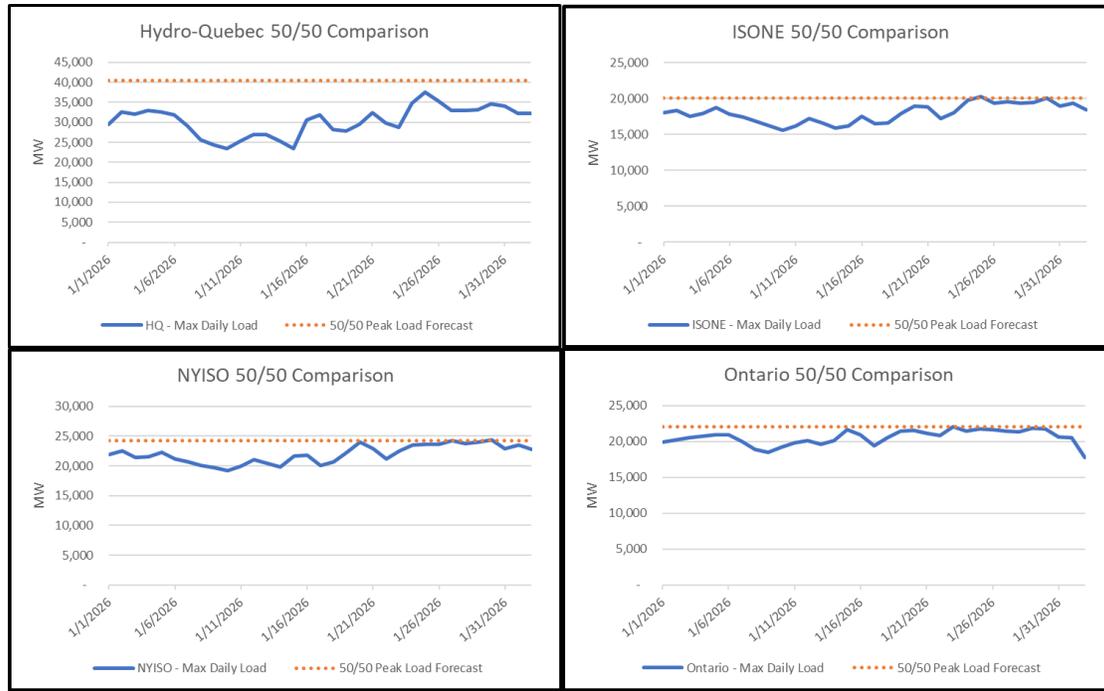
Starting on January 16, 2026, Hydro-Quebec began deliveries over the newly energized NECEC DC transmission line into the U.S. In theory, at least, these deliveries were generated by hydroelectric dams in Quebec. However, a three-year drought in Quebec has changed the pattern of flows between the U.S. and Canada. While the flows envisaged when the NECEC project was planned assumed a significant surplus north of the border, reservoirs are now at their lowest levels in many years. As stated in the 2017 NECEC proposal, “Hydro-Québec is fully capable of delivering a firm 1,090 MW every hour of the year, including during Québec’s peak period in winter, over the Project for the full 20 years of the PPA.”<sup>1</sup> This was not the case in January.

It has been assumed, without checking, that loads in Canada and the U.S. were at unusually high levels. Actually, comparing the loads with the forecasted levels from the Northeast Power Coordinating Council study shows that the loads roughly matched forecasts:

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<sup>1</sup> <https://www.nrcm.org/wp-content/uploads/2019/01/HRERequestforProposal.pdf>, page 5.

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In reality, the problem had more to do with the reserve margins in Canada and the United States.

A standard tool in electric utility planning is the reserve margin. The reserve margin is the surplus of resource capacity over adjusted loads. A simple way to think of this is for a household with four cars and three drivers. The household’s reserve margin is 33%.<sup>4</sup>

Large reserve margins are good for consumers since the chance of an interruption in service is very low. The methodology for calculating reserve margins and operating reserve requirements is set out for most of North America by the North American Electric Reliability Corporation (NERC). NERC has six reliability councils that cover most of Canada, Mexico, and the United States. New York, New England, Ontario, and Quebec are parts of the Northeast Power Coordinating Council which issued their one hundred and fifty-six page winter reliability study in November 2025.<sup>5</sup>

<sup>2</sup> Northeast Power Coordinating Council. (2025). *Winter 2025–2026 reliability assessment*. Northeast Power Coordinating Council. [https://cdn.prod.website-files.com/67229043316834b1a60feba3/6945e81e95da038263b95b1f\\_NPCC\\_2025-26\\_WinterReliabilityAssessment\\_Report.pdf](https://cdn.prod.website-files.com/67229043316834b1a60feba3/6945e81e95da038263b95b1f_NPCC_2025-26_WinterReliabilityAssessment_Report.pdf).

<sup>3</sup> McCullough Research data based on public sources.

<sup>4</sup> 4 cars / 3 drivers = 1.33. The margin of supply over needs is 33%.

<sup>5</sup> Northeast Power Coordinating Council. (2025). *Winter 2025–2026 reliability assessment*. Northeast Power Coordinating Council. <https://cdn.prod.website->

The reserve margin at Quebec this winter is very low compared to Ontario, New York, and New England:

Winter 2025-2026 - Week of Jan 18	50/50 Forecast (MW)	90/10 Forecast (MW)	Above 90/10 Forecast (MW)	Winter 2025-2026: Week of Jan 18	Normal Forecast (MW)	90/10 Forecast (MW)	Above 90/10 Forecast (MW)
Installed Capacity	45,884	45,884	45,884	Installed Capacity (+)	37,958	37,958	37,958
Net Interchange	-389	-389	-389	Net Interchange (+)	-420	-420	-420
Dispatchable Demand-Side Management (+)	265	265	265	Dispatchable Demand-Side Management (+)	868	818	818
<b>Total Capacity</b>	<b>45,760</b>	<b>45,760</b>	<b>45,760</b>	<b>Total Capacity</b>	<b>38,406</b>	<b>38,356</b>	<b>38,356</b>
Peak Load Forecast (-)	40,446	42,723	44,019	Peak Load Forecast (-)	22,042	23,273	23,871
Interruptible Load (+)	4,362	4,362	4,362	Known Maintenance & Derates (-)	10,345	9,716	9,716
Known Maintenance & Derates (-)	5,594	5,594	5,594	Operating Reserve Requirement (-)	1,567	1,567	1,567
Operating Reserve Requirement (-)	1,500	1,500	1,500	Unplanned Outages (-)	1,148	1,567	1,567
Unplanned Outages (-)	1,500	1,500	2,000	<b>Net Margin (MW)</b>	<b>3,304</b>	<b>2,233</b>	<b>1,455</b>
<b>Net Margin (MW)</b>	<b>443</b>	<b>-1,234</b>	<b>-3,030</b>	<b>Net Margin (%)</b>	<b>15.0</b>	<b>9.6</b>	<b>6.1</b>
<b>Net Margin (%)</b>	<b>1.1</b>	<b>-2.9</b>	<b>-6.9</b>				

Table 4-8: Québec Operable Capacity Forecasts for Winter 2025-2026

Table 4-6: Ontario Operable Capacity Forecast for Winter 2025-2026

Winter 2025-2026 (SCC) - Week of Jan 11	50/50 Forecast	90/10 Forecast	Above 90/10 Forecast	Winter 2025-2026 - Week of Jan 18	Normal Forecast (MW)	90/10 Forecast (MW)	Above 90/10 Forecast (MW)
Operable Capacity + Non-commercial Capacity	29,367	29,367	29,367	Installed Capacity (+)	40,080	40,080	40,080
Net Interchange (+)	935	935	935	Net Interchange (+)	1,203	1,203	1,203
Dispatchable Demand-Side Management (+)	440	440	440	Dispatchable Demand-Side Management (+)	1,026	1,026	1,026
<b>Total Capacity</b>	<b>30,742</b>	<b>30,742</b>	<b>30,742</b>	<b>Total Capacity</b>	<b>42,083</b>	<b>42,083</b>	<b>42,083</b>
Peak Load Forecast (-)	20,056	21,125	21,948	Peak Load Forecast (-)	24,200	25,239	26,281
Interruptible Load (+)	0	0	0	Interruptible Load (+)	1	1	1
Known Maintenance & Derates (-)	804	804	804	Known Maintenance & Derates (-)	3,550	3,550	3,550
Unplanned Outages and Gas at Risk (-)	6,252	7,031	7,966	Operating Reserve Requirement (-)	2,620	2,620	2,620
Operating Reserve Requirement (-)	2,125	2,125	2,125	Unplanned Outages (-)	2,426	2,426	8,733
<b>Net Margin (MW)</b>	<b>1,505</b>	<b>-343</b>	<b>-2,101</b>	<b>Net Margin (MW)</b>	<b>9,514</b>	<b>8,475</b>	<b>1,126</b>
<b>Net Margin (%)</b>	<b>7.5</b>	<b>-1.6</b>	<b>-9.6</b>	<b>Net Margin (%)</b>	<b>39.3</b>	<b>33.6</b>	<b>4.3</b>

Table 4-4: New England Installed and Operable Capacity for Winter 2025-2026

Table 4-5: New York Operable Capacity Forecast for Winter 2025-2026

The actual reserve margin is calculated by adding the Operating Reserve Requirement to the Net Margin. Quebec’s winter reserve margin is only 4.23%. Corresponding values for ISO New England, Ontario, and the New York ISO are 26.41%, 30.27%, and 12.83%.<sup>6</sup>

<sup>6</sup> Ibid, page 22, page 20, Ibid, page 19, Ibid, page 17.

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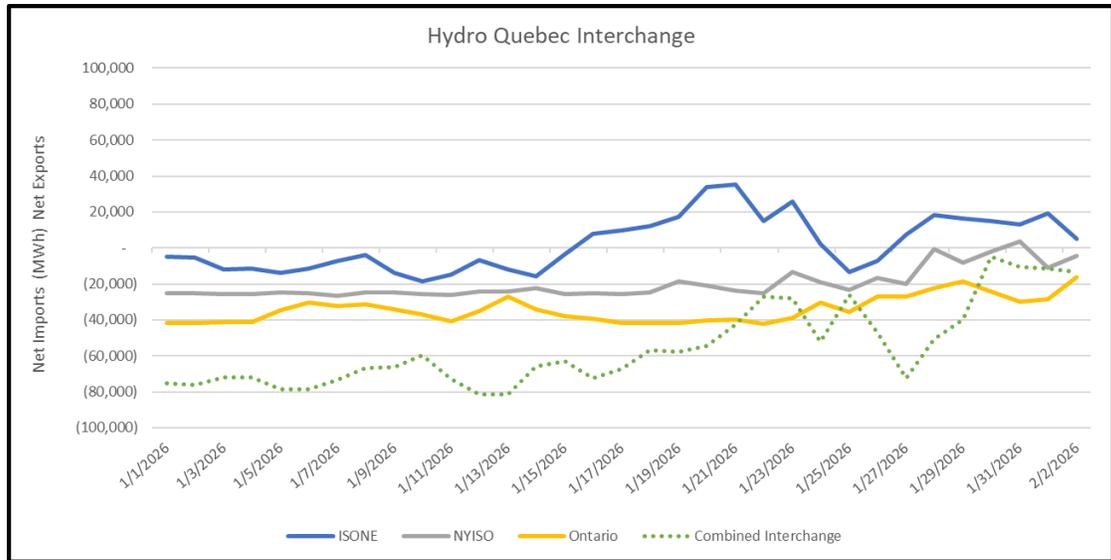
	50/50 Forecast (MW)			
	HQ	ISONE	NYISO	Ontario
Installed Capacity	45,884	29,367	40,080	37,958
Net Interchange (+)	(389)	935	1,203	(420)
Dispatchable Demand-Side Management (+)	265	440	1,026	868
Total Capacity	45,760	30,742	42,083	38,406
Peak Load forecast (-)	40,446	20,056	24,200	22,042
interruptible load (+)	4,362	-	1	-
Known Maintenance & Derates (-)	5,594	804	3,550	10,345
Operating Reserve Requirement (-)	1,500	2,125	2,620	1,567
Unplanned outages (-)	1,500	6,252	2,426	1,148
Net Margin (MW)	443	1,505	9,514	3,304
Net Margin (%)	1.10%	7.50%	39.30%	15.00%
<b>Net Reserves</b>	<b>4.23%</b>	<b>26.41%</b>	<b>30.27%</b>	<b>12.83%</b>

The winter storm in late January stressed all four regions – but stressed Quebec most of all since they had the smallest reserve margin. It is early to see exactly where the problems started, but lower reservoir levels reduced the potential energy available for hydroelectric generation. Other operating problems can also occur during cold weather.

As the NECEC started up, Hydro-Quebec was importing large amounts of energy from all three neighbors and – when able – exporting the energy down the NECEC to meet their U.S. obligations. Since all electrons are identical, deciding where the gray thermal electrons went and where the blue hydro electrons went will be a job for lawyers and philosophers.

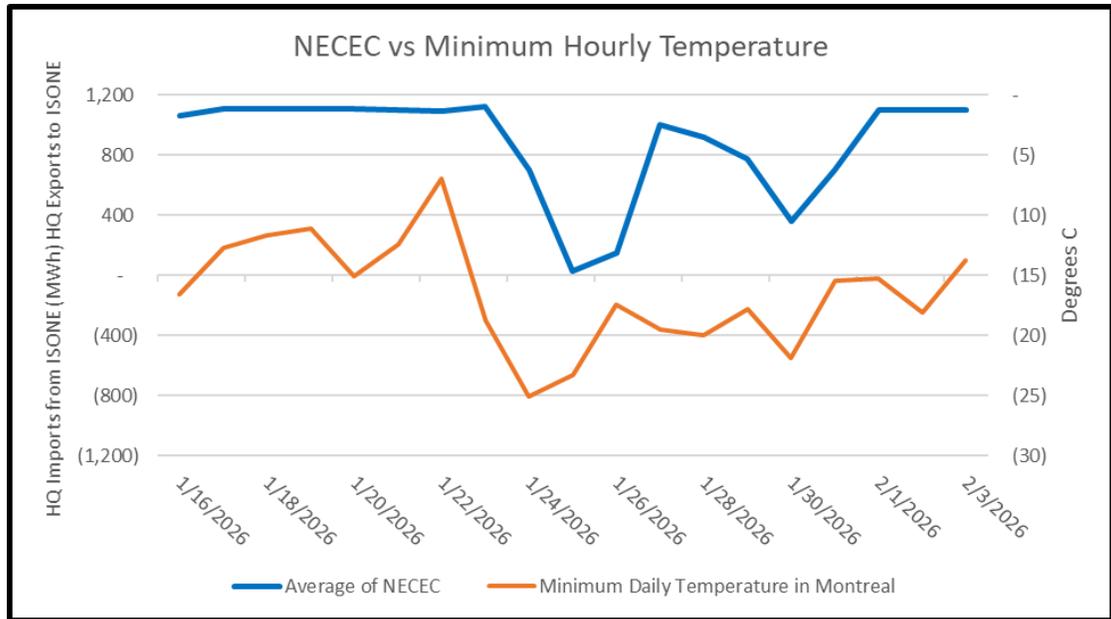
In January 2026, Hydro-Quebec both exported to and imported from ISO New England, in many cases simultaneously. At the same time, Hydro-Quebec was importing from the New York ISO and Ontario:

<sup>7</sup> McCullough Research data based on public sources.



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Interruptions on the NECEC were frequent and tended to occur when loads in Quebec were high due to the cold weather:



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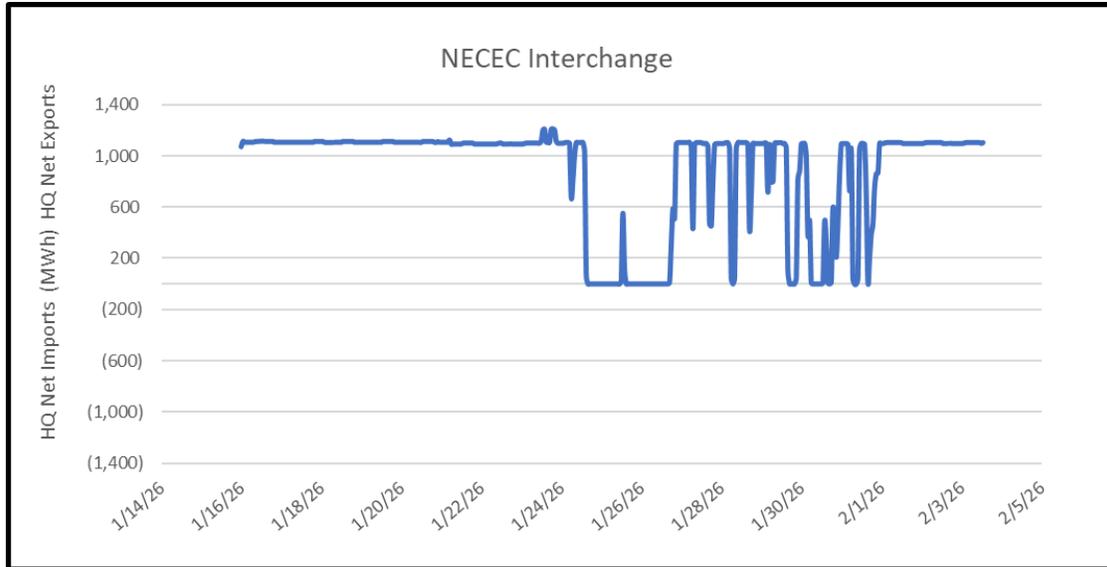
<sup>8</sup> McCullough Research data based on public sources, [https://donnees.hydroquebec.com/explore/dataset/importations-exportations-avec-transits/information/?flg=en-us&sort=-importations\\_sources\\_newengland\\_gas](https://donnees.hydroquebec.com/explore/dataset/importations-exportations-avec-transits/information/?flg=en-us&sort=-importations_sources_newengland_gas).

<sup>9</sup> McCullough Research data based on public sources, <https://montreal.weatherstats.ca/download.html>.

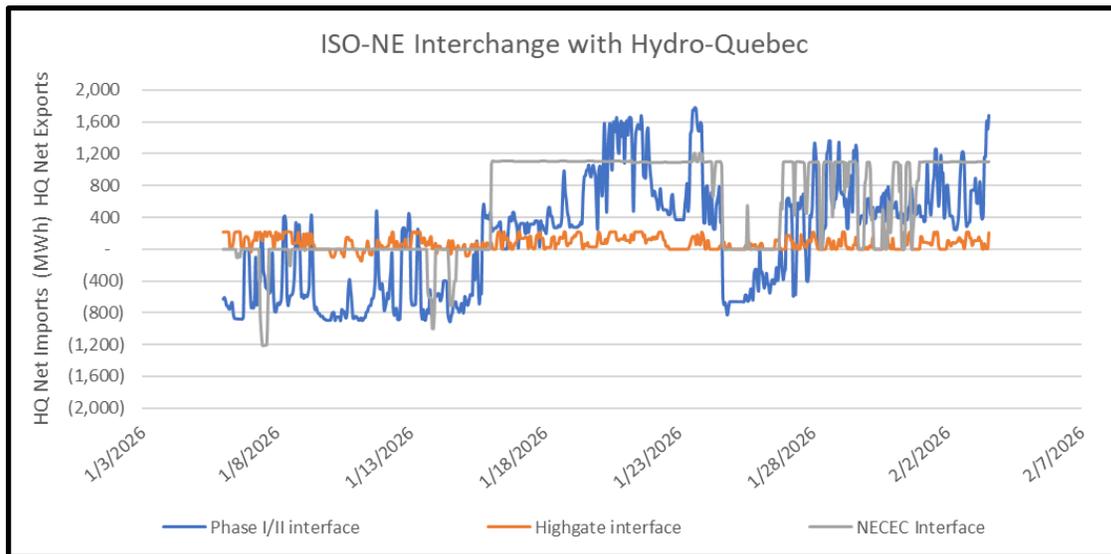
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How did Hydro-Quebec get into such a precarious situation?

Probably the most important impact on Hydro-Quebec is the long-term drought that has brought their reservoirs to the lowest levels in years:

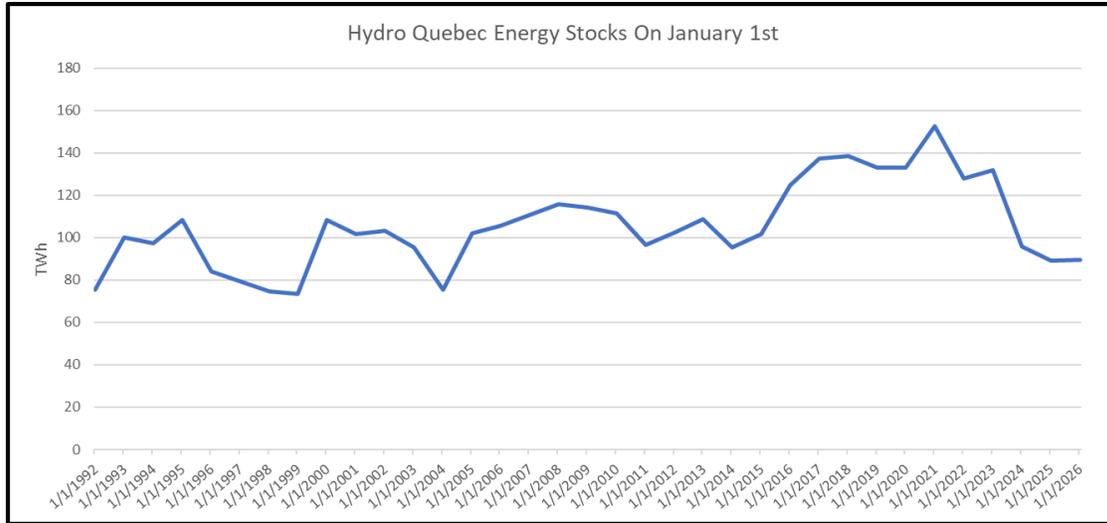
<sup>10</sup> McCullough Research data based on public sources, <https://www.iso-ne.com/isoexpress/web/reports/grid/-/tree/real-time-actual-five-minute-scheduled-interchange>

<sup>11</sup> Ibid.

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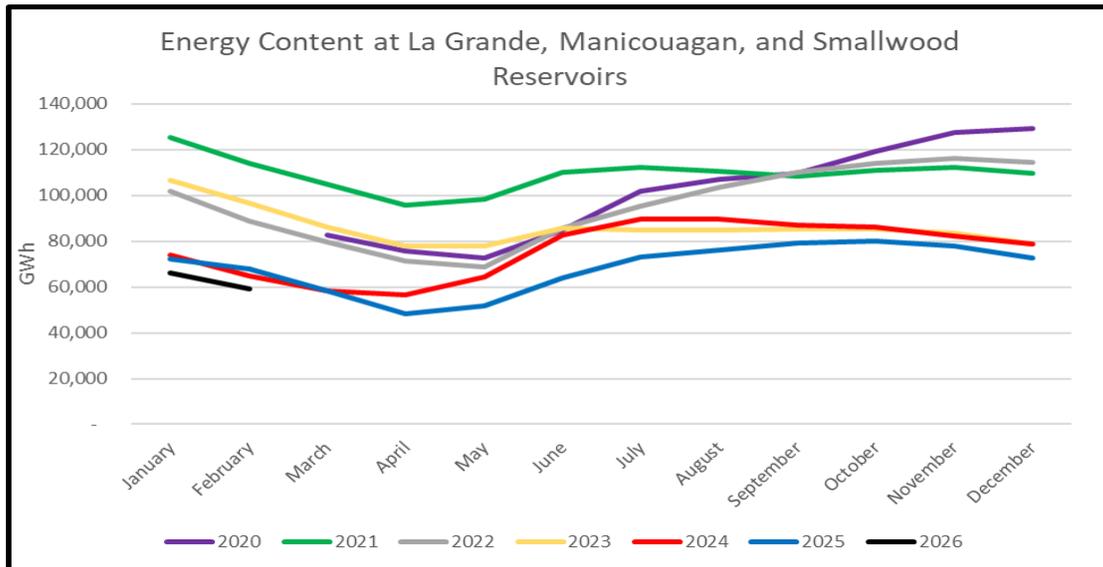
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Hydro-Quebec employs three major reservoirs: Caniapiscau on James Bay, the Manicouagan crater on the North Coast of the Saint Lawrence River, and Smallwood in Labrador. The energy content of all three has declined markedly over the current drought. This reduces Hydro-Quebec’s flexibility significantly. As the level of reservoirs decline, the potential energy available to generate electricity also declines.



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<sup>12</sup> McCullough Research data based on public sources, annexeb-etat-des-reserves-fiabilite-energetique-20251130 (en).pdf.

<sup>13</sup> McCullough Research data based on public sources.

In winter months, reservoir levels drop to generate enough electricity to meet higher winter loads. This decline continues through March and usually ends in April when higher temperatures melt the winter's accumulation of snow and ice. Over summer and fall, the reservoirs gradually refill. Since 2023, this has not been the case.

To summarize: In January 2026, Hydro-Quebec's loads were very close to their forecasts, but their capacity reserves were very low and the drought in Quebec constrained their ability to supply electric energy. The drought significantly reduced the fuel source, water, for the vast majority of Quebec generation. Quebec has drawn down reservoirs lower than usual due to the duration of the drought, reducing Quebec's operating flexibility for their hydroelectric system. Quebec was simultaneously importing thermal energy from neighboring regions and exporting energy on the NECEC – except during frequent periods when NECEC exports were interrupted.