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## **Critical Evaluation of *Trading Up: Ideas to Improve Quebec's Cap-and-Trade System Clean* – A Report Commissioned by Clean Prosperity**

### **A Research Note of the Chaire sur la décarbonisation**

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The Quebec emissions trading system and its linkage with a similar system in California warrants careful and evidence-based review. A recent report by Pierre-Olivier Pineau and Vincent Thivierge (2025), *Trading Up: Ideas to Improve Quebec's Cap-and-Trade System*, published by Clean Prosperity in the summer of 2025, contributes to this discussion but exhibits several notable shortcomings. While agreeing that reforms of the Quebec emissions trading system are necessary—as already pointed out in a report of the independent Climate Change Advisory Committee published last year (CCCC, 2024)—the Clean Prosperity report paints an unduly negative portrait of the linked emissions trading system and makes a number of inaccurate claims about its performance. Such a portrayal risks undermining the support for the linked California-Quebec emission trading system.

This note has been written in light of the author having been invited to serve as a peer-reviewer for the Clean Prosperity report. However, some of the comments and suggestions provided during peer review do not appear in the final published version. This note therefore offers additional context and clarification to address inaccurate claims made in the Clean Prosperity report that, if left unchallenged, could erode support for the California–Québec linkage. These include:

- (1) Ignoring emission allowances imported from California in the evaluation of progress towards Quebec's 2030 target;
- (2) Exaggerating overallocation and ignoring other explanations of observed carbon prices;
- (3) Exaggerating emission leakage in California and ignoring recent developments;
- (4) Failing to be transparent about the costs of reaching Quebec's 2030 emission reduction target without linkage to California; and
- (5) Ignoring the increasing international support for emissions trading and other carbon market instruments.

This research note concludes with an alternative interpretation of the California-Quebec emissions trading system as a catalyst of North American climate action and calls for greater rigour regarding

research into the linked California-Quebec emissions trading system and carbon markets in general. Indeed, momentum is building towards a North America subnational linked emissions trading system, particularly since the September 2025 decisions by the California government to extend their carbon market through 2045 and the expected linkage with the State of Washington in 2026. Continued participation by Quebec is essential to sustaining this growing momentum. Any future decisions regarding the province's role in the system should be guided by solid, evidence-based research.

## **1) Ignoring emission allowances imported from California in the evaluation of progress towards Quebec's 2030 target**

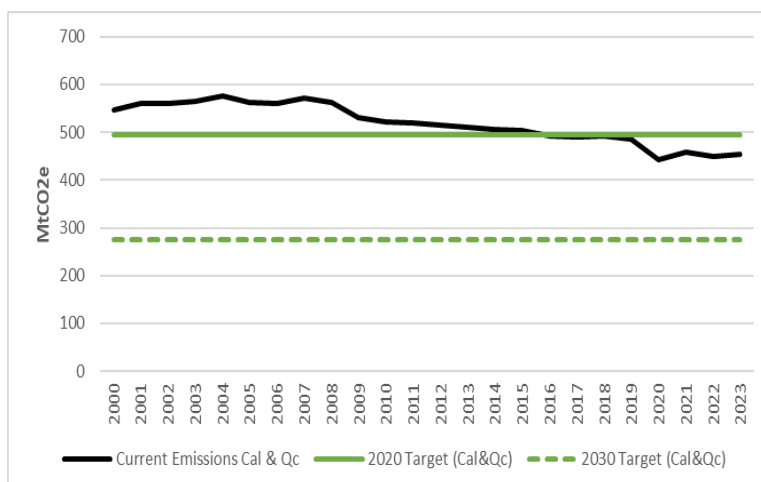
The report incorrectly asserts that Quebec is not on track to reach its 2030 emission reduction target, despite emissions trading between jurisdictions. However, this ignores the very logic of an emissions trading system, which is to incentivize collective emission reductions between participating jurisdictions with the understanding that it will be less costly to reduce emission reductions in one jurisdiction relative to another.

All linked emissions trading systems are characterized by emissions being reduced to a greater extent in one jurisdiction relative to others. In the situation of the linkage between California and Quebec, it is well established in the techno-economic modeling research on emissions trading for the two jurisdictions (CARB, 2012; MFQ, 2017; WCI Economic Modeling Team, 2012) and in the peer-reviewed literature (Purdon et al., 2021) that more emission reductions will be achieved in California relative to Quebec because the latter's power sector is largely already decarbonized. Emission reductions in Quebec must be realized in relatively more costly sectors such as buildings and transportation whereas those in California are able to be achieved in the power sector. This pattern played out with regard to the 2020 emission reduction target (MELCCFP, 2022). Quebec reduced emissions 13.4% below 1990 levels on Quebec's territory alone but this increased to a reduction of 26.6% when recognizing emission allowances imported from California.

Important recent studies of the generally positive performance of the California emissions trading system are omitted. A recent meta-analysis finds that California's cap-and-trade program reduced GHG emissions an estimated 15 percent in its early years primarily through abatement in the utility sector (Döbbling-Hildebrandt et al., 2024). A recent study published in the Journal of Public Economics finds that California's cap-and-trade program reduced GHG emissions by over 40 percent between 2012 and 2017 for industrial facilities regulated only by the program and not any other climate policy (Hernandez-Cortes and Meng, 2023). There are concerns that since COVID-19, emission reductions in California have slowed down. See Figure 1 for combined emission trends in California and Quebec. This performance explains the attention that the price of carbon on the joint emissions trading system has been attracting—an issue to which I turn in the next section.

The authors' failure to recognize the emissions imported from California into Quebec suggests a lack of appreciation for the institutional framework governing the linked emissions trading system. It operates under a clear and robust legal framework established by the *Agreement Concerning the Harmonization and Integration of Cap-and-Trade Programs for Greenhouse Gas Emissions*, first signed in 2013 and renewed in 2017 (Roch and Papy, 2019). Far from being informal, this agreement provides the juridical and institutional foundation for the mutual recognition of emission allowances, joint auctions, and a shared registry administered through Western Climate Initiative Inc., a nonprofit entity governed by service contracts with both jurisdictions. Each party's domestic regulatory system—the Quebec *Règlement sur le système de plafonnement et d'échange de droits d'émission de gaz à effet de serre* and California's *Cap-and-Trade Regulation* under the Air Resources Board—legally authorizes the issuance, transfer, and use of allowances originating in the other jurisdiction. The Entente also codifies procedures for consultation, withdrawal, and accounting to ensure environmental integrity and compliance with domestic law. In short, the Quebec–California linkage constitutes a legally binding intergovernmental arrangement, integrated into each jurisdiction's regulatory apparatus and recognized as a lawful mechanism for cross-border emissions trading.

**Figure 1: Trends in Combined Emission Trends of California and Quebec, 2000-2023**



Note: Numbers in the figure have been derived from California and Quebec GHG emission inventories, including an early estimate of 2023 emissions in California (CARB, 2025). Green line and dotted line indicate 2020 and 2030 joint emission reduction targets.

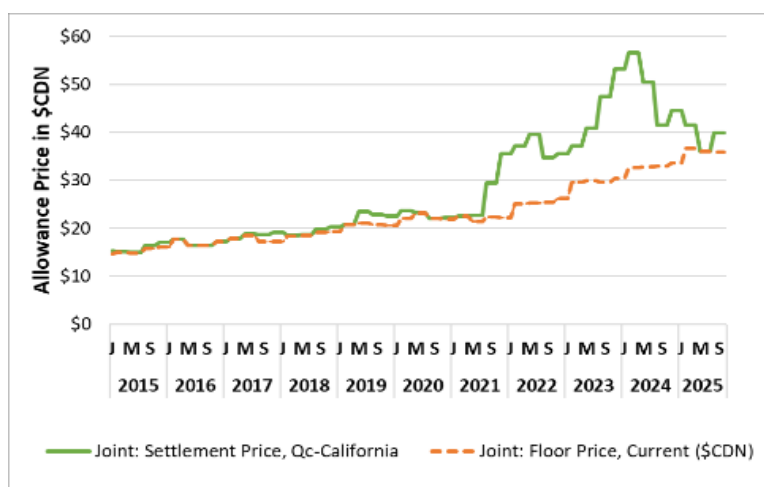
## 2) Exaggerating overallocation and ignoring other explanations of observed carbon prices

Beyond emissions accounting, the report also mischaracterizes price dynamics in the linked emission trading system. The authors correctly point to the challenges of overallocation, whereby more emission allowances circulate on the market than are required by firms, reducing carbon prices on the market. Overallocation is problematic because it depresses carbon prices, reducing the incentive for firms in California and Quebec to decarbonize. But its importance can also be exaggerated. As the

European Union has demonstrated with regards to its emissions trading system (Borghesi et al., 2023), over-allocation is something that can be readily managed. Indeed, California and Quebec have been taking steps to address over-allocation since at least 2022, when the California Air Resources Board (CARB) recognized the need to evaluate potential changes including the evacuation of surplus allowances and lowering California's emission reduction targets (CARB, 2022). Rather, because of linkage, carbon market prices on the California-Quebec carbon are better explained by the mitigation ambition and domestic politics in California. See Figure 2 below for allowance prices obtained at quarterly auction on the linked California-Quebec emissions trading system over the past decade.

Mitigation ambition is reflected in the emission reduction targets. Quebec's targets have been amongst the most ambitious in North America. These include a 2020 target of 20% below and 2030 target of 37.5% below 1990 levels while the provincial government has indicated that it "intends to make a commitment for achieving carbon neutrality by 2050" (MELCCFP, 2025). However, because of market linkage, carbon market prices in Quebec also reflect ambition in California. Notably, California only sought to attain 1990 emissions levels for its 2020 target. The difference in levels of ambition translated into considerably higher mitigation costs in Quebec than in California, which helps to explain the direction of trade, but also low carbon prices during over 2014-2020, when settlement prices on the joint emissions trading system hovered around the price floor. However, California's 2030 target has been significantly more ambitious: in 2016 California adopted a 2030 target of 40% below 1990 emissions levels (CARB, 2017) and further reduced this to 48% below 1990 levels in 2022 (CARB, 2022). This suggests that rising prices are related to the coming into force of a much stricter cap in California since 2021. Furthermore, California adopted a target of 85% below 1990 levels for 2050.

**Figure 2: Allowance Prices on the California-Quebec Emissions Trading System (\$/tCO<sub>2</sub>e), 2015-2025**



*Note: Prices derived from quarterly auction reports published by the Quebec Ministry of Environment and the Fight Against Climate Change*

A second factor is political uncertainty about the future of the California emissions trading system. The decline in market prices since 2024, which hit the carbon price floor at the May 2025 auction, can largely be attributed to the delay in California of extending their emissions trading system beyond 2030 (CPC, 2025)—something only recently resolved, in September 2025, with legislation to extend the California emissions trading system through 2045 (Windorf, 2025). As indicated earlier, the governments of California and Quebec held workshops on the potential removal of excess allowances in summer 2023. The California Air Resources Board (CARB) published a Standardized Regulatory Impact Assessment (SRIA) of the emissions trading system in spring 2024 (CARB, 2024). This is a nonbinding technical analysis of potential regulatory amendments that must be completed before CARB can propose formal regulatory language initiates a process for legal adoption by the Governor’s administration. But this process was delayed by high-level, closed-door political negotiations over the course of 2024-2025, which convincingly maps onto carbon price declines at quarterly carbon auctions (CPC, 2025). Only in September 2025, after the August carbon market auction, the California state legislature adopted with a two-thirds majority an extension California’s emissions trading system through 2045, amongst other reforms, allowing the formal rulemaking process led by CARB to proceed. While it is too soon to tell, it might be expected that carbon market prices on the California-Quebec emissions trading system increase substantially at the November 2025 auction. But this is not the first time that political uncertainty has periodically affected prices on the linked California-Quebec emissions trading system. Prices on the secondary carbon market dropped below the carbon price floor in 2016 during a previous episode of political indeterminacy in California (Diodati and Purdon, 2016).

### **3) Exaggerating emission leakage in California and ignoring recent developments**

The report raises concerns about the environmental integrity of imported allowances purchased by Quebec firms. However, Here the authors exaggerate concerns about carbon leakage in California’s emissions trading system, drawing on old arguments that do not reflect recent policy developments (Cullenward, 2014; Lo Prete et al., 2024). In particular, these old arguments fail to recognize that all the coal plants in states exporting electricity to California have shut down or shifted to natural gas since 2020. Note that the Lo Prete study is based on data from 2013-2016.

Leakage is problematic because it weakens the cap, making it easier for electric utilities to meet emission reduction goals. This is a problem unique to California as the state imports just under one-third of its electricity (CEC, 2024b)—the most of any state in the US (EIA, 2020)—while Quebec is a net exporter of electricity. California imports hydroelectricity from the Pacific Northwest (largely BC, Washington and Oregon) while states in the Southwest (primarily Utah, Nevada, Arizona and New Mexico) deliver power primarily from coal-fired and natural-gas sources (CEC, 2024a). In 2022, clean imports from the Pacific Northwest accounted for approximately 40% of imports with 60% remaining coming from power generated in Southwest.

Essentially, the concern is that under the emissions trading system, California utilities are incentivized to import relatively cleaner gas-fired electricity from the Southwest rather than coal-fired power generation produced there. The risk is that utilities in Southwest—at times even owned by California entities—export relatively cleaner gas-fired electricity to California while still burning coal for domestic power consumption. As a result, California utilities claim their emissions have declined whereas they have simply bought-up cleaner gas-fired electricity that might otherwise have been sold for domestic consumption in Southwest states, who continue to generate coal-fired electricity, with no effect on total emissions.

While rules governing California’s responsibility for emission leakage are worth greater attention, the emission-leakage critique is largely moot, as coal-fired power generation has been shutting down in the Southwest United States. Significantly, four of the six coal-fired power plants cited in Cullenward have already ceased operation, one is set to be shut down in 2025 while the closure of the last has been advanced by seven years (Table 1). Power generation in the Southwest has become notably cleaner in recent years. Consequently, it is difficult to see the resource shuffling critique as currently valid given that emissions in states from which California has imported its electricity is falling as coal-fired power plants fall out of favour.

**Table 1: Recently closed and planned closure of coal-fired power plants exporting to California**

<b>Coal-Fired Power Plant</b>	<b>Operational status</b>	<b>Capacity (MW)</b>	<b>State</b>
<b>Closed</b>			
Navajo Generating Station	Ceased operation in 2019	2,250	Navajo Nation near Arizona
Reid Gardner Generating Station	Ceased operation in 2017	557	Nevada
San Juan Generating Station	Ceased operation in 2019	1,848	New Mexico
Boardman Coal Plant	Ceased operation in 2020; replaced by gas-fired plant	550	Oregon
<b>Closure Planned in Near Term</b>			
Intermountain Power Plant	To be replaced in 2025 with a power plant powered by natural gas/green hydrogen	1,900	Utah
Four Corners Generating Station	To cease operations in 2031, seven years ahead of schedule	1,540	Navajo Nation near New Mexico

#### **4) Failing to be transparent about the costs of reaching Quebec’s 2030 emission reduction target without linkage to California**

While questioning the value of cross-jurisdictional cooperation, the report does not address the significant costs Quebec would face if it were to endeavour to reduce emissions to reach its 2030 emission reduction target on Quebec territory alone, without linkage to California. Other techno-economic modeling research indicates that this would need to rise to at least \$300 CDN per tonne CO<sub>2</sub>e (tCO<sub>2</sub>e) (Purdon, 2024), however the most recent carbon market prices are under \$40 per tCO<sub>2</sub>e. It is unlikely that such a cost would be socially acceptable given that \$300 CDN per tCO<sub>2</sub>e would translate into an additional approximately 60¢ per liter of gasoline by 2030.

Instead, the authors routinely make reference to the now rescinded federal carbon tax. Indeed, they draw explicit attention to the price disparity between the carbon price in Quebec and that of the federal carbon tax, which were \$40 and \$80 CDN per tCO<sub>2</sub>e in early 2025. However, in so doing they avoid discussion of the political headwinds that the federal carbon tax had been facing. This is unfortunate as they tend to underappreciate the political viability of the Quebec emissions trading system, where low carbon prices have still achieved significant reduction in emissions through cooperation with California.

#### **5) Ignoring the increasing international support for emissions trading and other carbon market instruments**

The authors discredit carbon markets as a form of international cooperation on climate change mitigation, despite consensus on their appropriateness by the United Nations Framework Convention on Climate Change. Indeed, at the 2024 UN climate change conference in Azerbaijan, final agreement on the operationalization of international carbon markets under Article 6 of the Paris Agreement was achieved, including international emissions trading systems, carbon offsetting and other mechanisms (Arora, 2025; Caneill and Cassen, 2025). With diffusion of emissions trading systems spurred by the EU’s carbon border adjustment (GCCP, 2025; ICAP, 2025), the international landscape for carbon markets is being reconfigured. According to International Carbon Action Partnership’s most recent status report, emissions trading systems currently cover about 19% of global greenhouse gas emissions—including policies already in force in countries such as China, Indonesia, Kazakhstan and under development in Brazil, India, Turkey, Vietnam and Chile (ICAP, 2025).

#### **6) Conclusion**

The Quebec Minister of Environment is currently reflecting on whether to revise Quebec’s 2030 emission reduction target. Until recently, with the repeal of the federal Carbon tax, the Quebec carbon market has attracted little political attention, with some even calling it “invisible” (Mousseau, 2025). While the title of the Clean Prosperity report *Trading Up: Ideas to Improve Quebec’s Cap-and-*

*Trade System* suggests improvements to the carbon market, inaccurate claims like those discussed in this research note paint an unduly negative picture of the emissions trading system. In addition to critiques from conservative media, including a questionable survey of public support of the Quebec carbon market (Côté, 2025), this might lead political support for the linkage to decline. It remains unclear whether this outcome aligns with the authors' intent, but such interpretations risk eroding public support for the system.

In a recent interview, one of the authors, Professor Pierre-Olivier Pineau suggested that revising Quebec's emission reduction target downward might be preferred: "I wouldn't be opposed to it. Because we're fooling ourselves. I don't like hypocrisy. I'd rather we be honest and say, 'We're not meeting our targets—here are the ones we can realistically achieve'" (Lecavalier, 2025). To the extent that such a recommendation is based on inaccurate claims about the performance of the linked California-Quebec carbon market, those committed to advancing effective climate action should carefully scrutinize such claims.

Indeed, another interpretation is possible. Given the high cost of emissions abatement in Quebec, with some techno-economic modeling suggests might need to reach \$300 per tCO<sub>2</sub>e to reach the 2030 target, the Quebec government has taken the responsible decision to coordinate its emission reduction efforts with those of other jurisdictions, including California, where decarbonization is comparative less costly than in Quebec. Under a set of rules established between the two jurisdictions, emissions allowances purchased by firms in one jurisdiction are recognized to contribute to the emission reduction target of the other. The effect is to spread the cost of reducing emissions amongst participating jurisdiction. While prices on the linked emissions trading system have declined over the recent year, this has largely been due to political instability in California while both governments have agreed to take action on overallocation.

With California's decision to extend their carbon market through 2045, momentum is building in North America towards a subnational coalition of like-minded jurisdictions linking their emissions trading systems that includes Quebec and, soon, the State of Washington, but also potentially Oregon and New York that are actively pursuing economy-wide emissions trading systems. This matches continued expansion of emissions trading systems in the EU as well as other developed countries and emerging economies (ICAP, 2025). Continued participation by Quebec is essential to sustaining this growing momentum. Future decisions on Quebec's emissions trading system must rest on solid, evidence-based research, since informed and empirically grounded debate is vital to maintaining political legitimacy and deepening North American climate cooperation.

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