

**CAPITAL FLIGHT TO THE UNITED STATES UNDER THE CAP-AND-TRADE
SYSTEM**



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23 February 2022

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SUMMARY

As Quebec's cap-and-trade system, the SPEDE (Système de Plafonnement et d'Échange de Droits d'Émission), enters its 10th year, some of the structural distortions in the program are becoming more marked, leading to capital flight, and moving Quebec further away from its 2030 GHG emission reduction targets. Here are some highlights:

1. **The MELCC's** (Ministère de l'Environnement et de la Lutte contre les Changements Climatiques) **3rd consolidated compliance** report for the period 2018-2020 demonstrates:
 - a. Compliance of the 126 Quebec companies and organizations subject to the SPEDE¹.
 - b. An increase in the use of regulated offset credits (ROCs) from 3.5% to 6.9%, approaching the 8% allowable limit of a compliance portfolio for organizations subject to the SPEDE.
 - c. 2.9% of the ROCs that were bought by the 126 organizations subject to the SPEDE came from reduction projects carried out in Quebec. The remaining 97.1% were acquired in the United States, constituting an increase in capital flight to the United States of America.
 - d. This capital outflow is approximately \$239 million CAD which, without an adjustment to the SPEDE, will increase by 2030.
2. Information from the **latest Western Climate Initiative (WCI) balance report**, dated October 5, 2021, shows the following:
 - a. California has emitted 214 times more ROCs than Quebec. Quebec has issued ≈1,052,400 ROCs.
 - b. This gap is growing and has been since the WCI began in 2014.
 - c. For the 2021-2023 period, the available space for ROCs will be around 13 million, of which less than 80,000 ROCs will be issued on projects in Quebec.
 - d. Each purchase of ROCs made outside of Quebec, by Quebec companies subject to the SPEDE constitutes a capital flight² and delays the achievement of the government's 2030 targets.
3. **The distortions inherent in the "Cap & Trade" approach** to regulate markets exist throughout the world and can be rectified:
 - a. Any regulated "Cap & Trade" approach brings its own set of distortions³.
 - b. Several jurisdictions around the world have adjusted their Cap & Trade system.

¹ <https://www.environnement.gouv.qc.ca/infuseur/communiqué.asp?no=4673>

² <https://www.lequotidien.com/chroniques/claude-villeneuve/pas-a-nous-de-payer-8055d0b3f272268245465306d9133a7a>

³ http://www.vgq.gouv.qc.ca/fr/fr_publications/fr_rapport-annuel/fr_2016-2017-CDD/fr_Rapport2016-2017-CDD-Chap04.pdf

<https://www.foreignaffairs.com/articles/world/2018-06-14/why-carbon-pricing-isnt-working?cid=soc-tw-rdr>

- c. California, Quebec's partner in the WCI, implemented such an amendment, in July 2017, limiting the purchase of ROCs that are and will be made outside of its territory.
- d. Simple administrative or regulatory adjustments to the SPEDE can be applied to correct its distortions.
- e. The decision-making lever, on adjustments to the SPEDE, is currently in the hands of the MELCC.

Introduction

As the SPEDE (Système de Plafonnement et d'Échange de Droits d'Émission) cap-and-trade system enters its tenth year, various analysts are questioning its performance as a greenhouse gas (GHG) emission reduction tool. Achieving its GHG emission reduction targets of -37.5% below 1990 levels and net zero by 2050⁴ relies on encouraging the most polluting companies to invest in emission reductions. A portion of the emissions allowances are distributed free of charge by the government, while the remaining emissions must be reduced or financially offset through the acquisition of emissions allowances mainly traded and acquired through the Western Climate Initiative (WCI) auctions. A maximum of 8% of emissions can also be covered by regulated offset credits (ROC). However, a certain number of these credits come from projects carried out in the United States and recognized by California and not by Quebec, which does not, in fact, encourage the reduction of GHGs on Quebec territory. An analysis of the Quebec government's data on the SPEDE allows us to detail this observation.

This paper presents a general portrait of the evolution of the performance of the SPEDE from 2013 to 2020 (1), an analysis of Quebec's positioning in the regulated common carbon market with California (2), a synthesis of data on the Quebec domestic market (3) and finally an examination of capital flight linked to the rigidities of the current SPEDE framework (4).

1. Overall picture of the evolution of the SPEDE market from 2013 to 2020

This section outlines the major developments that have occurred under the SPEDE from its inception to the end of 2020 (Table 1⁵).

First, there has been an increase in the number of organizations subject to SPEDE, from 55 in 2013-2014 to 118 in 2015-2017 and 126 in the following period. The sharp increase in 2015 is explained by the subjection of fossil energy distributors that are above the threshold of 200 liters of fuel distributed annually and consumed by their customers. The number of SPEDE participants, excluding fossil fuel distributors, increased slightly, mainly due to the recruitment of voluntary organizations emitting between 10,000 and 25,000 mtCO₂eq per year.

This rise in the number of companies subject to the regulated market has had a mechanical effect on the share of free allocations distributed by the government. It has thus fallen from 102% in 2013-2014 to around 30% for subsequent periods. It is important to note, however, that the

⁴ [Engagements du Québec \(gouv.qc.ca\)](https://www.gouv.qc.ca/engagements-du-quebec)

⁵ [Rapport-conformite2014.pdf \(gouv.qc.ca\)](https://www.gouv.qc.ca/rapport-conformite2014.pdf)
[rapport-conformite2015-2017.xlsx \(live.com\)](https://www.live.com/rapport-conformite2015-2017.xlsx)
[rapport-couverture-2018-2020.xlsx \(live.com\)](https://www.live.com/rapport-couverture-2018-2020.xlsx)

number of free allowances, which was supposed to decrease year by year in order to push for emission reduction measures, only started to decrease in 2020.

The last trend observed is that of a growth in the use of ROCs, which has almost reached the 8% cap allowed by regulations. This is certainly linked to the two previous phenomena described. A decrease in the availability of free allowances may indeed encourage companies to turn to ROCs, which are less expensive than emission rights acquired at auction, to meet their compliance obligations. This growth has an impact on the regulated carbon market prices, which are increasing (see section 3). Potentially, this situation could also stimulate the production of ROCs, and thus the implementation of new reduction projects.

Table 1: SPEDE Changes from 2013 to 2020

	2013-14 Period	2015-17 Period	2018-20 Period
Number of reporting companies	55	118	126
Total emission rights	36 664 703	176 145 518	178 178 587
Total ROCs	298 812	6 088 155	13 531 354
Share of ROCs (%)	0,8%	3,5%	7,6%
Total free allowances	37 518 715	55 924 154	54 835 684
Share of free allowances (%)	102%	32%	31%
Non-vintage units	0	1 262 137	11 985
Credits for early reduction	1 950 677	70 128	1 424

These developments are visually represented in the graph below.

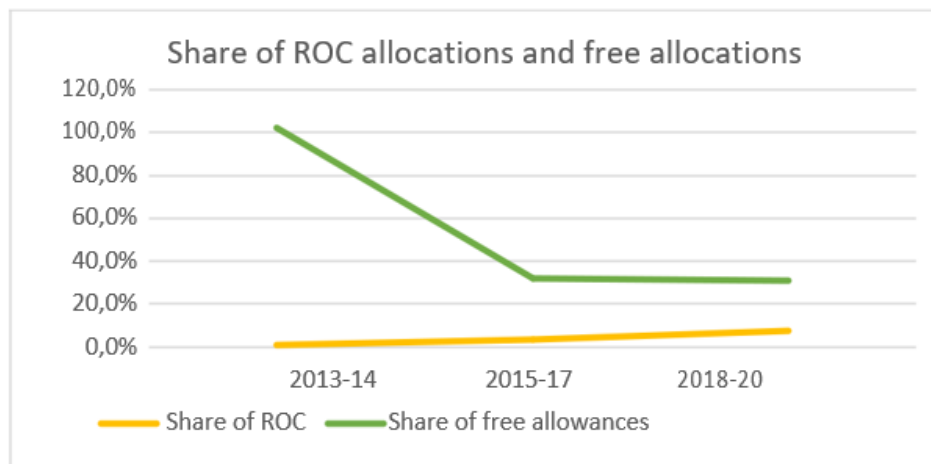


Figure 1: Evolution of the share of free allowances and ROCs in the SPEDE

It is also interesting to compare the evolution of the gap between the aforementioned free allowances and reported GHG emissions. While until 2018, more free allowances than emissions were granted, in 2019 and 2020 the trend has reversed slightly, as shown in Table 2 and Figure 2. In addition, the reason the number of free allowances is expected to drop from 18,231,662 in 2020 to 13,814,248 in 2021 according to official figures is because the number of allowances is readjusted during the year. The final figures are not yet available.

Table 2. Evolution of the gap between reported GHG emissions and free allowances⁶

	Declared GHG emissions of emitters over 25,000 mtCO₂eq subject to the SPEDE (MtCO₂eq)	Free allowances distributed to emitters of more than 25,000 mtCO₂eq subject to the SPEDE	Difference between reported emissions and free allocations	Percentage difference between reported emissions and free allocations
2012	19 057 982	-	-	-
2013	18 441 091	18 916 605	-475 514	-2,58%
2014	18 223 612	18 602 110	-378 498	-2,08%
2015	18 199 745	18 743 474	-543 729	-2,99%
2016	17 777 259	18 406 196	-628 937	-3,54%
2017	18 368 699	18 774 484	-405 785	-2,21%
2018	17 387 416	17 661 166	-273 750	-1,57%
2019	18 967 951	18 948 532	16 540	0,10%
2020	18 540 752	18 228 922	309 090	1,68%
2021	-	13 814 248	-	-
Total	164 964 507	162 101 356	2 863 151	1,74%

⁶ [Rapport-conformite2014.pdf \(gouv.qc.ca\)](#)

[rapport-conformite2015-2017.xlsx \(live.com\)](#)

[rapport-couverture-2018-2020.xlsx \(live.com\)](#)

[Quantité d'unités d'émission versées en allocation gratuite et liste des émetteurs qui en ont bénéficié \(gouv.qc.ca\)](#)

[liste-etablisements-visesRSPEDE.xlsx \(live.com\)](#)

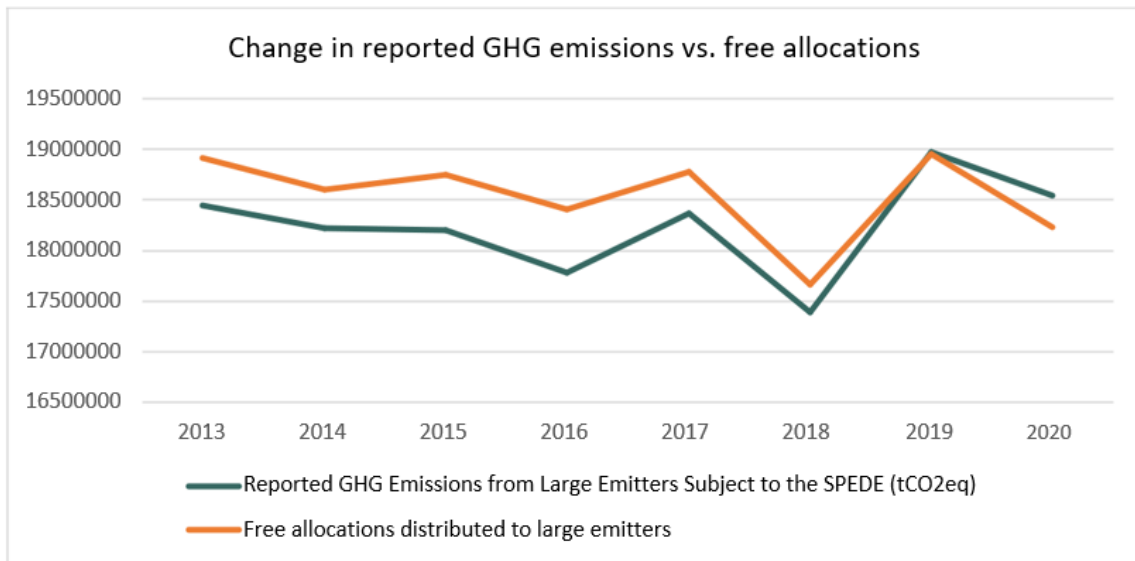


Figure 2. Evolution of the gap between reported GHG emissions and free allowances

2. Quebec's position in the common market for regulated offset credits (ROCs)

As part of the WCI, a common carbon market has been in place since 2014 between Quebec and California. ROCs issued in one of the participating regions can be acquired by companies from another member region.

However, the different regions are not equal in their annual GHG emissions and ROC production. Figure 3 shows the growing gap between the production of ROC resulting from projects developed in the U.S. and recognized by California versus Quebec. The difference has been increasing steadily: California recognized 136 times more ROC in 2015, compared to about 213 times more in 2020⁷.

There has therefore been an increase in the number of ROC acquisitions outside Quebec by Quebec companies, especially since Quebec's ODS (Ozone Depleting Substances) ROC category has expired. Indeed, most of the ODS have already been destroyed. The Trottier Energy Institute has questioned, in February 2022, the legitimacy of ROCs in this category⁸.

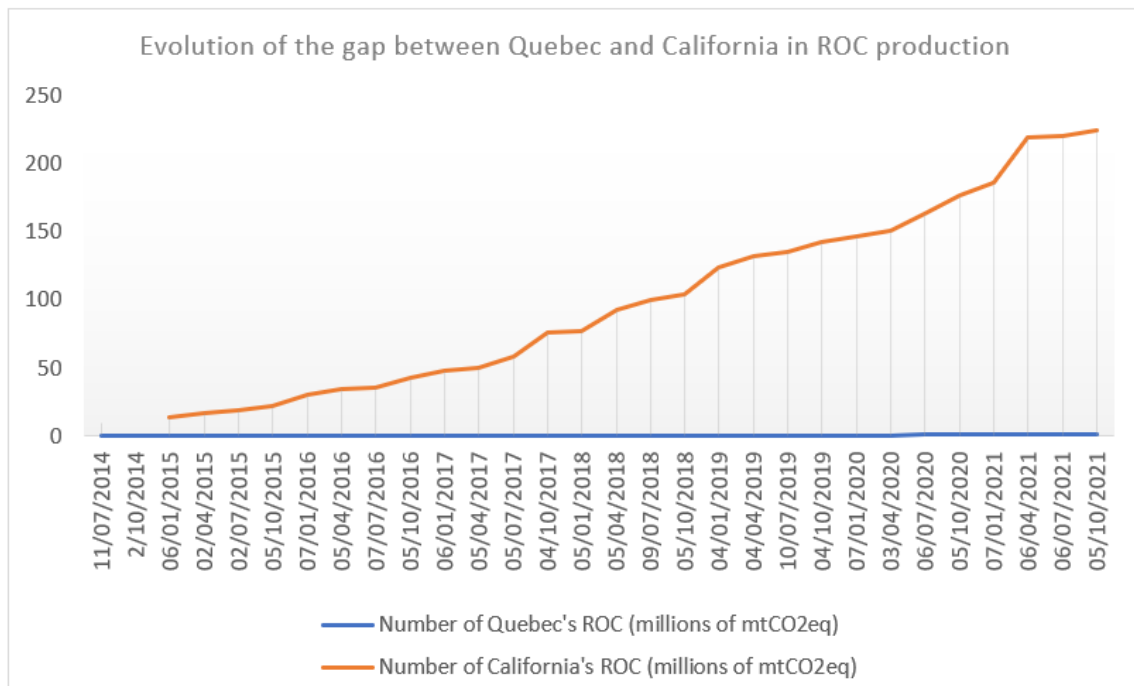


Figure 3. Evolution of the gap between Quebec and California in ROC production

A capital flight arises from that gap, and it is reflected in the percentage of ROC resulting from projects carried out in the US and authorized by California purchased by Quebec companies. Table

⁷ Documentation - Le marché du carbone (gouv.qc.ca)

⁸ https://plus.lapresse.ca/screens/592d58b4-18d0-4c20-bd82-baf2cb2483e7__7C__0.html?utm_content=email&utm_source=lpp&utm_medium=referral&utm_campaign=internal+share

3 shows that the share of ROC acquired outside Quebec has increased. It **increased from 90.4% to 97.1% between the 2015-2017 period and the 2018-2020 period**. The number of ROCs purchased from Quebec companies is minimal for this last period. It is less than 3% (Graph 4.) Appendix I presents a breakdown by U.S. state of ROCs from different projects that were purchased in the United States. The top five states account for 59% of these purchased ROCs, and are, in order: Alaska, West Virginia, Oregon, Wisconsin, and Maine. California supplied only 1.92% of the ROCs purchased by Quebec⁹ companies.

Second, for market analysis purposes, the question arises as to which type of U.S. project is being purchased by most Quebec companies. Two types of projects carried out in Quebec are available: Ozone Depleting Substances (ODS) destruction and landfill methane capture. Four types of projects carried out in the US and recognized by California have been acquired by Quebec companies: forestry projects, manure pit projects, methane capture in mines and ODS destruction. Other types of projects are certified under California-specific protocols, such as landfill methane capture. But ROCs issued in other categories have not been purchased by Quebec companies.

Table 3 shows that most Quebec companies purchase forestry projects in the United States. These projects are related to carbon sequestration and not to the reduction of CO₂ emissions. Carbon sequestration is the storage of carbon in reservoirs. There are three methods by which humans can do this: terrestrial biomass (trees), geological reservoirs and mineral carbonation. The latter is the only permanent form of sequestration, but it is not yet widely applicable. The only way to permanently reduce the amount of CO₂ in circulation is therefore emissions source reduction.

The predominant purchase of forestry project ROCs (of the "plant a tree" type) can be explained by the immediate benefits in terms of corporate image, by the large availability of ROCs on the market, by the acquisition price offered lower than other ROC projects, by the lack of knowledge and/or understanding of other types of projects.

It could therefore be relevant for Quebec, in order to limit capital flight, to allow offsetting by forestry projects carried out in Quebec. It would also be relevant to recognize and use carbon credits from voluntary carbon markets (VCM) carried out in Quebec and recognized by credible international programs. Better explaining other projects and their importance is also a solution.

⁹ CARB Offset Credits Issued - Table

Table 3. ROCs use by Quebec companies (2013-2014 data unavailable)¹⁰

Project categories	2015-2017 period	2018-2020 period
Percentage by project category		
Forestry projects in the United States (CAFR)	75,6%	83,3%
Manure pit projects in the United States (CALs)	2,2%	4,4%
Ozone-depleting substances projects in the U.S. (CAOD)	4,4%	4,0%
U.S. mine methane capture projects (CAMM)	8,2%	5,5%
Landfills - Destruction of CH₄ in Quebec (LE)	1,8%	2,5%
Destruction of ODS in Quebec (SACO)	7,8%	0,4%
Total ROCs from the United States	5 503 021	13 143 303
Total ROCs from Quebec	585 134	388 051
Percentage of ROC from the United States	90,4%	97,1%
Percentage of ROC from Quebec	9,6%	2,9%

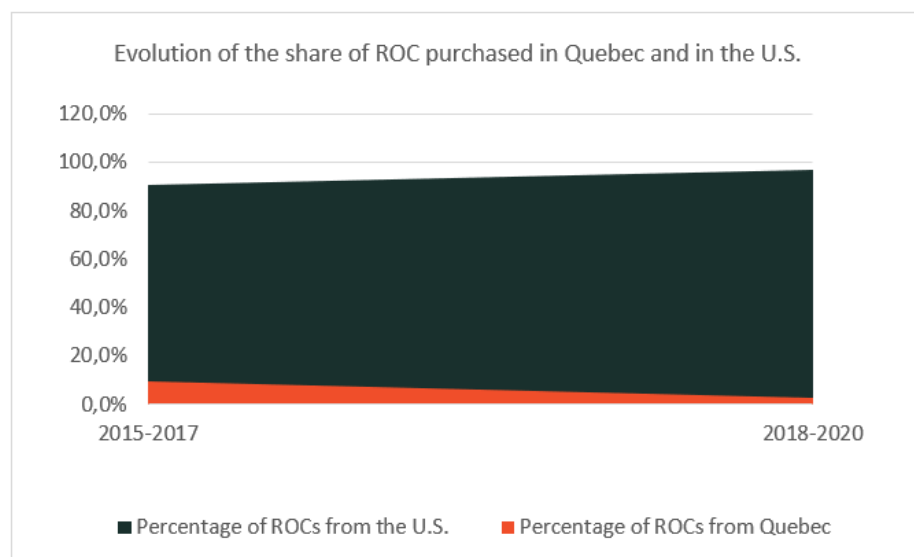


Figure 4. Evolution of the share of ROC purchased in Quebec and in the United States

¹⁰ [rapport-conformite2015-2017.xlsx \(live.com\)](#)

[rapport-couverture-2018-2020.xlsx \(live.com\)](#)

In addition, the number of ROCs from Quebec projects available for purchase is far below what is needed. Indeed, as shown in Table 4, just under 80,000 Quebec ROCs are currently available for the 2021-2023 compliance period, whereas for the 2018-2020 period alone, companies subject to the SPEDE purchased over thirteen million of these credits.

Table 4. Balance of Quebec ROCs available for purchase¹¹

	Number of Quebec ROCs
Number of ROCs recognized by MELCC reported on the WCI	1 052 400
Quantity of ROCs used - 2015-2017	585 134
Quantity of ROCs used - 2018-2020	388 051
Balance	79 215

¹¹ <https://www.environnement.gouv.qc.ca/changements/carbone/credits-compensatoires/index.htm>

3. Analysis of Quebec's domestic market

In Quebec, there are two categories of organizations subject to the cap-and-trade regulation¹². The first category is industrial emitters releasing more than 25,000 metric tonnes of CO₂eq per year. The second category is fossil fuel distributors, which are fossil fuel distributors that sell more than 200 liters of fuel per year consumed by their customers. They were made subject to the SPEDE as of 2015 and have no right to free allowances because they can pass on the emissions allowances to consumers.

Table 5 details the relative share of the two categories in the share of ROCs remitted to the Quebec government. It shows that the portion of fossil fuel distributors increases from period to period, making up 72% of the total for 2018-2020. They therefore represent the largest market share for sellers of regulated offset carbon credits.

Table 5. Relative share of industrial emitters and energy distributors in the ROCs remitted

	2013-2014 Period	2015-2017 Period	2018-2020 Period
Emitters +25,000t CO₂eq			
Compliance obligation (mt CO ₂ éq.)	36 664 703	54 345 703	54 896 119
Emission units delivered	36 664 703	52 432 324	51 085 317
Offset credits issued	298 812	1 913 379	3 810 802
Share of ROCs in units remitted	0,8%	3,5%	6,9%
Energy distributors			
Compliance obligation (mt CO ₂ éq.)	S/o	121 799 815	123 282 468
Emission units delivered	S/o	117 625 039	113 561 916
Offset credits issued	S/o	4 174 776	9 720 552
Share of ROCs in units remitted	S/o	3,4%	7,9%
Grand total of compliance obligations	36 664 703	176 145 518	178 178 587
Grand Total Offset Credits Issued	298 812	6 088 155	13 531 354
Relative share of ROCs remitted by emitters above 25000 mt CO₂ eq.	100%	31%	28%
Relative share of ROCs delivered by energy distributors*.	0%	69%	72%

* Fossil fuel distributors have been subject to the SPEDE since January 1, 2015.

¹² Légis Québec (gouv.qc.ca)

Figure 5 provides a visual representation of the changing share of the two categories of SPEDE participants.

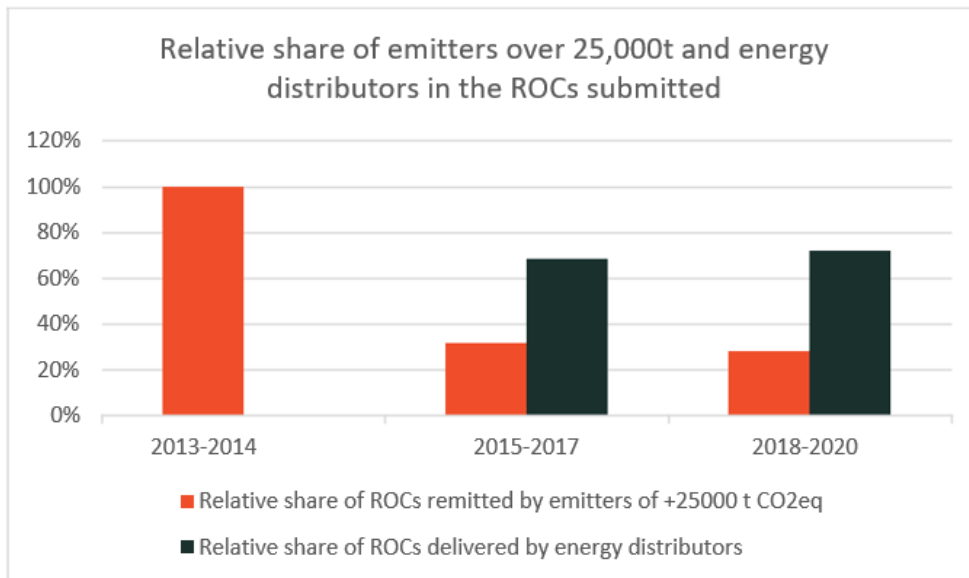


Figure 5. Relative share of industrial emitters and energy distributors in remitted ROCs

In order to understand the market, it is relevant to rank the fifteen largest purchasers of ROCs among Quebec companies subject to the SPEDE. Table 6 below gives such a ranking by the number of ROCs delivered between 2018 and 2020.

Table 6. The fifteen ROCs largest buyers in Quebec

The fifteen ROCs largest buyers in Quebec*	ROCs remitted between 2018 and 2020
Valero Energy Inc. (energy distributor) **	4 503 095
Energir, L.P. (energy distributor) **	2 892 757
Suncor Energy Products G.P. (energy distributor) **	2 277 164
Rio Tinto Alcan Inc. (industrial emitter)	705 943
Shell Canada Products (energy distributor)	635 417
Norcan Petroleum Products G.P. (energy distributor) **	408 482
Valero Energy Inc. (industrial emitter)	295 807
Suncor Energy Products L.P. (Industrial emitter)	276 194
Aluminerie Alouette inc. (Industrial emitter)	263 320
ArcelorMittal Long Products Canada (industrial emitter)	241 640
ArcelorMittal Mining Canada (industrial emitter)	223 700
Rio Tinto Fer et Titane Inc. (industrial emitter)	215 000
McInnis Cement Limited Partnership (industrial emitter)	179 777
CRH Group Canada Inc. (industrial emitter)	176 500
Ciment Québec inc. (industrial emitter)	161 300
Percentage of total ROCs purchased	99%

*In blue: energy distributors; in green: industrial emitters

**Energy distributor figures are estimates in the absence of public data from MELCC (Ministère de l'Environnement et de la Lutte contre les changements climatiques). The results were obtained on the basis of the distributors' GHG emissions, available on the MELCC¹³ website, and a report from the Régie de l'Énergie du Québec¹⁴ determining the market share of the largest distributors. For gas, a report from Energir¹⁵ revealing the quantity of gas distributed annually was crossed with the carbon intensity of the gas and with the share of ROCs remitted, i.e. 8%¹⁶.

¹³ liste-etablisements-visesRSPEDExlsx (live.com)

¹⁴ [www.regie-energie.qc.ca/energie/Pétrole-Analyses/Rapport prix à la rampe PG_Final_ 2020.pdf](http://www.regie-energie.qc.ca/energie/Pétrole-Analyses/Rapport%20prix%20à%20la%20rampe%20PG_Final_2020.pdf)

¹⁵ [https://www.energir.com/~/_media/Files/Corporatif/Dev durable/Rapport-Resilience-Climatique-Energir-2020.pdf](https://www.energir.com/~/_media/Files/Corporatif/Dev%20durable/Rapport-Resilience-Climatique-Energir-2020.pdf)

¹⁶ rapport-couverture-2018-2020.xlsx (live.com)

4. The flight of carbon capital to the United States

The dynamics described in the previous sections result in capital flight to the United States. It is important to quantify this flight.

For this purpose, the evolution of the average price of ROCs and emission units has been compiled in Table 6 and is represented in Figure 6. According to MELCC estimates, the average price of ROCs has increased from \$10.71 in 2014 to \$18.50 in 2020¹⁷. Thus, there is strong demand for the regulated carbon market, which is causing an upward trend in the unit prices of ROCs and emissions units. Growing public and customer pressure is driving many companies to buy ROCs. This is because ROCs are less expensive than emission units, which increases demand and thus leads to price and market growth. Furthermore, as illustrated in the table below, the price gap between emission units and ROCs has narrowed: a ROC represented, on average, 80% of the average price of an emission unit, compared to 84% in 2019 and 83% in 2020.

Table 7. Evolution of the average price of ROCs and emission units in CAD (2014-2020)

	2014	2015	2016	2017	2018	2019	2020
ROCs Average price – WCI Common market (2014-2020)	10,71 \$	13,37 \$	14,73 \$	15,61 \$	17,24 \$	18,72 \$	18,51 \$
ROCs Average price in Québec (2014-2020) *	0,00 \$	0,00 \$	0,00 \$	15,08 \$	16,01 \$	16,80 \$	18,14 \$
Emission Units average price	13,46 \$	16,77 \$	16,86 \$	18,48 \$	19,83 \$	22,41 \$	22,38 \$
Price difference between emission units and ROCs	80%	80%	87%	84%	87%	84%	83%

* The price is 0 in Quebec for 2014, 2015 and 2016 because no transactions were recorded by the MELCC.

¹⁷ [sommaire-transactions-annuelle-trimestrielle-2020.xlsx \(live.com\)](#)

[Sommaire-transactions-2019.xlsx \(live.com\)](#)

[Sommaire-transactions-2018.xlsx \(live.com\)](#)

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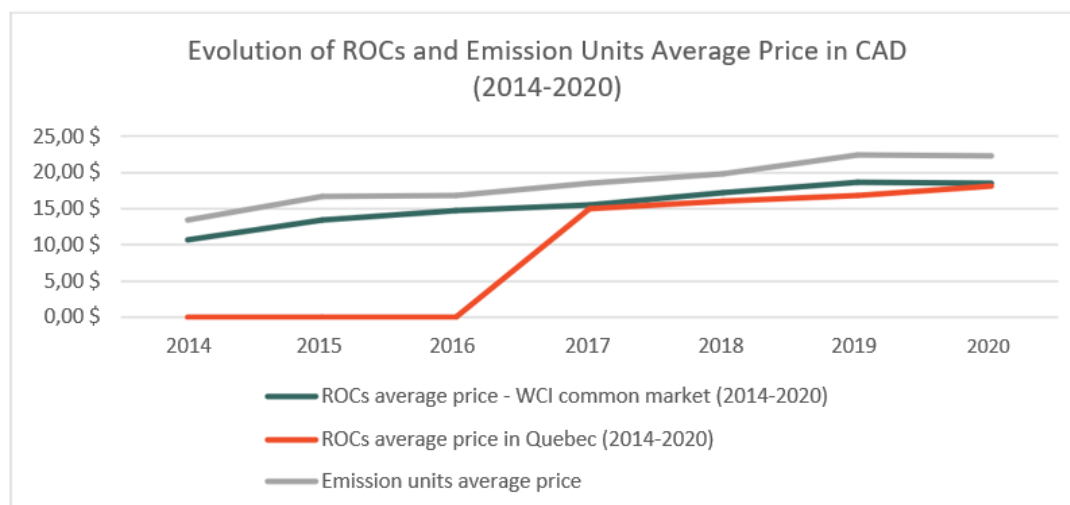


Figure 6. Evolution of the average price of ROCs and emission units in CAD (2014-2020)

Then, the amount of capital sent to the US was evaluated using a simple methodology. The average price of ROCs was multiplied by the number of ROCs that Quebec companies purchased in the US for each period (data unavailable for 2013-2014). In all, between 2015 and 2020, there is a total of CAD 318,817,587.44 that would have been sent to the US by Quebec firms when purchasing ROCs issued by California. Table 7 and Chart 7 detail these figures.

The incentive role of the SPEDE through the pricing of GHG emissions would therefore not be achieved in the case of Quebec, since very few projects can be sold as ROC. The incentive to carry out emission reduction projects to monetize them is therefore reduced. The framework imposed by the government is too restrictive. Other categories of projects should be eligible as ROCs in Quebec.

Table 8. Evaluation of capital sent to the US between 2015 and 2020 (CAD)

	2015-2017 Period	2018-2020 Period
ROCs number bought in California	5503021	13 143 303
ROCs average price (CAD)	14,57 \$	18,16 \$
Amount of money sent to the US (CAD)	80 179 015,97 \$	238 638 571,47 \$
Total capital sent to the US (2015-2020)	318 817 587,44 \$	

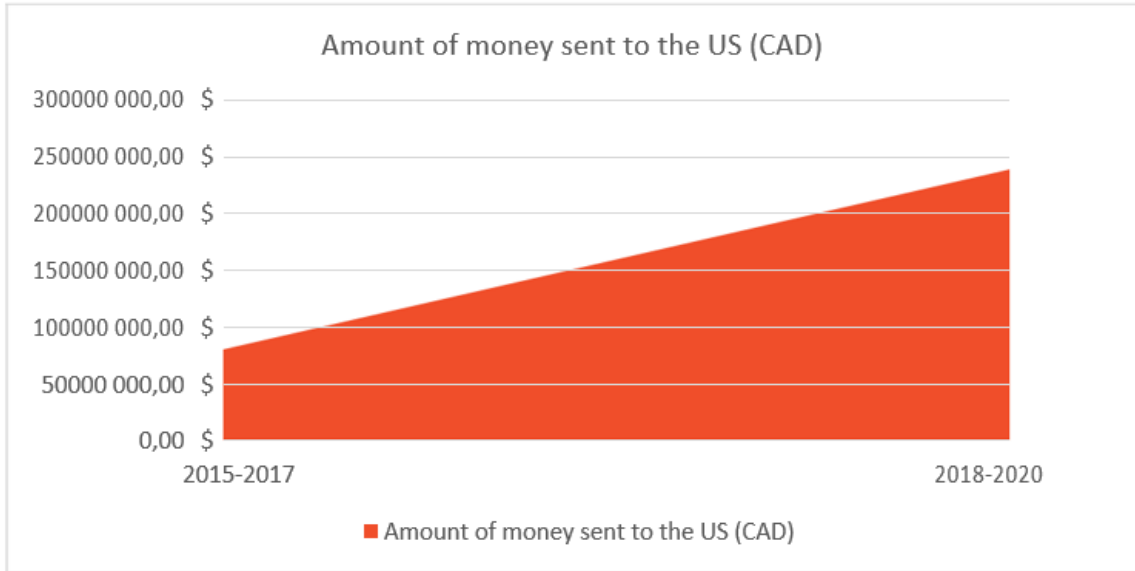


Figure 7. Amount of capital sent to the U.S.A.

Conclusions

1. The number of companies participating in the SPEDE jumped in 2015 as it was the first year fossil fuel distributors were subject to the program.
2. The share of free allowances used has only decreased since 2020, the year of the pandemic, as a result of more participating companies, while the share of ROCs has increased.
3. The gap between the production of ROCs in Quebec and in California continues to grow. In 2020, California produced 214 times more ROCs than Quebec.
4. ROCs issued in Quebec cannot satisfy local demand. Just under 80,000 are currently available for purchase (for the 2021-2023 period) while more than 13,5 million of them (about 4.5 million annually) were acquired outside Quebec, by Quebec companies, between 2018 and 2020.
5. As a result, 97% of ROCs were purchased in the U.S. between 2018 and 2020, compared to 90% in the previous period.
6. The three largest buyers of ROC in Quebec would be energy distributors (Valero, Energir and Suncor), according to our estimates.
7. The three largest industrial buyers are: Rio Tinto, Valero Refineries and Suncor.
8. Both ROCs prices and the prices of emission units are rising. This represents an increased risk of capital flight in the future.
9. The MELCC still has the power to limit capital flight. For example, it could expand the type of projects accepted as ROCs in Quebec.
10. The current structure of the SPEDE would not effectively achieve the 2030 GHG reduction targets without major economic impacts.

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APPENDIX I. Percentage of ROCs Remitted by U.S. State

State	Quantity of ROCs	Percentage by State
ALASKA	3566257	27,13%
WEST VIRGINIA	1428716	10,87%
OREGON	1211977	9,22%
WISCONSIN	805584	6,13%
MAINE	717935	5,46%
NEW YORK	714930	5,44%
MICHIGAN	594234	4,52%
OHIO	489719	3,73%
KENTUCKY	453802	3,45%
MINNESOTA	374516	2,85%
WYOMING	359663	2,74%
WASHINGTON	335494	2,55%
TENNESSEE	325593	2,48%
ARIZONA	301932	2,30%
CALIFORNIA	252006	1,92%
GEORGIA	211616	1,61%
IDAHO	155089	1,18%
NEW HAMPSHIRE	115196	0,88%
ARKANSAS	109619	0,83%
VIRGINIA	106042	0,81%
PENNSYLVANIA	105238	0,80%
CONNECTICUT	100000	0,76%
MONTANA	100000	0,76%
ILLINOIS	85000	0,65%
FLORIDA	45051	0,34%
NORTH CAROLINA	44431	0,34%
COLORADO	17942	0,14%
MASSACHUSETTS	15721	0,12%
Grand total	13143303	100,00%