



Are offset credits a viable economic strategy to reduce GHG emissions?

Presented to
Solutions Will

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23 december 2024

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1. Introduction

The practice of offsetting emissions of carbon dioxide (CO₂) or other greenhouse gases (GHGs) by reducing emissions elsewhere is not new. Over the past 30 years, the market for companies and individuals to voluntarily purchase "carbon credits" has grown rapidly.

But while there are systems recognized for their robustness, the offset mechanism is sometimes criticized for its confusion and lack of transparency. The lack of international regulation of carbon trading mechanisms has led to significant price inconsistencies, the emergence of dubious projects, alleged double counting and, in the worst cases, fraud. Some even claim that the offset mechanism is a flawed approach, a simple passport to continue polluting with impunity.

At a time when many stakeholders have committed to carbon neutrality and many others have yet to take their first steps, what role can offsets play in our decarbonization efforts?

This text demonstrates that the use of offsets alone will not be enough to stem the tide of global warming. Individuals, businesses, and governments must also be given greater incentives to consider the environmental consequences of their actions and reduce their carbon footprints.

However, in an imperfect world where efforts to reduce emissions remain inadequate, offsets have a key strategic role to play and are one of the essential tools to accelerate the reduction of greenhouse gas emissions. .

2. Offset Credits

Offset credits allow companies (or individuals) to voluntarily undertake projects in sectors and by companies that are not covered by the regulated carbon market, such as the cap-and-trade system (SPEDE), and receive regulated offset credits from the government in exchange for the reduction or removal of GHG emissions from the atmosphere generated by their projects.

Other carbon credits are also awarded through voluntary programs such as VCS, Gold Standard, which are two international certification frameworks for greenhouse gas emission reduction projects. They aim to ensure the credibility, transparency and environmental integrity of the carbon credits generated, and that these emission reductions are real, measurable, verifiable and additional.

These companies can then sell these credits to other organizations, whether subject to the carbon market or not, so that they can use them to meet their compliance obligations.

This system has been deemed credible and robust enough to be the subject of a decision from the very first days of COP29 (The Guardian, 2024a)¹. Indeed, new United Nations (UN) rules for the carbon credit market have been adopted, signaling their relevance in terms of offsetting GHG emissions..

2.1. Regulated and Voluntary Offset Credits

Regulated and voluntary carbon offsets differ in their objectives, participants, and operational frameworks.

Regulated offsets are part of compliance markets created by governments or international agreements, such as the European Union's first carbon market and the Western Climate Initiative (WCI). The cap-and-trade system (SPEDE) also includes this type of mechanism. These credits are linked to cap-and-trade regulations that require high-emitting industries, such as energy and manufacturing, to meet legally mandated emission reduction targets.

In contrast, voluntary markets operate outside these regulatory frameworks, allowing companies and individuals to offset their carbon footprint on their own initiative. These voluntary markets often finance smaller, innovative projects such as reforestation or renewable energy installations.

Credits in regulated markets, like voluntary credits, are strictly standardized and approved by governing bodies to ensure compliance with legal requirements.

Although not interchangeable with regulated credits, voluntary market credits encourage broader participation in sustainable development efforts. While regulated markets cover a significant portion of global emissions through mandatory participation, voluntary markets play a more modest role but support innovative and climate-friendly projects. This dual structure balances mandatory compliance with optional sustainable development initiatives.

¹ The adoption of articles 6.2 and 6.4 in Baku (COP29) confirmed the framework for voluntary carbon markets, initially conceptualized in December 2015 (Paris Agreement). A period of implementation and operationalization will take place gradually, and the whole process will be discussed again at COP33 in 2028.

2.2. Reducing Emissions through the Cap-and-Trade System

Quebec has chosen to address the issue of GHG emissions through, among other instruments, the SPEDE.

The SPEDE, or Quebec's carbon market, is an economic instrument that contributes to the reduction of GHG emissions by imposing a global annual emissions cap on all eligible emitters.

By using market forces to favor the lowest cost reductions, the SPEDE provides emitters with flexibility in the means they use to meet their compliance obligations, thereby reducing the overall cost of reducing GHG emissions.

3. Reducing and Offsetting – Regulated and Voluntary Offset Credits

As mentioned earlier, carbon credits can be purchased either voluntarily by companies or through the regulated market for the most polluting industries governed by the SPEDE. When the SPEDE was created in 2013, a system of regulated offset credits was integrated into it. In Quebec, offset credits are one of the options available to targeted emitters to cover their emissions, up to a maximum of 8% of their total emissions. The purchase and use of offset credits allow an emitter subject to the SPEDE to meet its compliance obligations at a lower cost.

Voluntary offset credits, on the other hand, come from projects that reduce emissions or remove CO₂ from the atmosphere in sectors (or sources) or organizations not subject to the SPEDE's compliance obligations (agriculture, landfills, and forestry, SMEs emitting annually < 25,000 tCO₂e). These projects could also meet the protocols recognized by the Ministry of the Environment, the Fight against Climate Change, Wildlife and Parks (MELCCFP). They are carried out voluntarily by a promoter (individual or legal entity, or municipality).

As the following sections will demonstrate, offset credits are not a perfect tool for combating climate change. However, considering the scale of the transformations needed to address the climate change challenge, this tool, imperfect as it may be, still contributes to the overall goal of reducing GHG emissions.

3.1. The Alleged Weaknesses of Carbon Credits

Critics of the use of offsets argue that if companies are allowed to use carbon credits to offset their emissions, they will avoid taking direct action to decarbonize. By this logic, fewer carbon credits would mean more impact.

This criticism would be valid if it were true. However, a closer analysis leads us to conclude that this approach actually does more harm than good:

1) First, the results of numerous studies suggest that companies that use offsets actually decarbonize more internally than those that do not. The argument is that if polluting companies don't care enough about climate change to offset their remaining emissions, they probably don't care enough to reduce them (Ecosystem Marketplace, 2023; MSCI, 2023; Sylvera, 2023a).

2) The idea that polluting companies that are discouraged from buying carbon credits will suddenly be willing and able to invest more in decarbonization does not seem to fit the reality. Many of the necessary technologies do not yet exist or are too difficult or costly to implement on a large scale in the immediate future. To meet GHG reduction targets, it is essential to combine both approaches, rather than relying on one or the other².

² See for example Securities and Exchange Commission [SEC] (2024). [FedEx Corporation: Form 10-K](#).

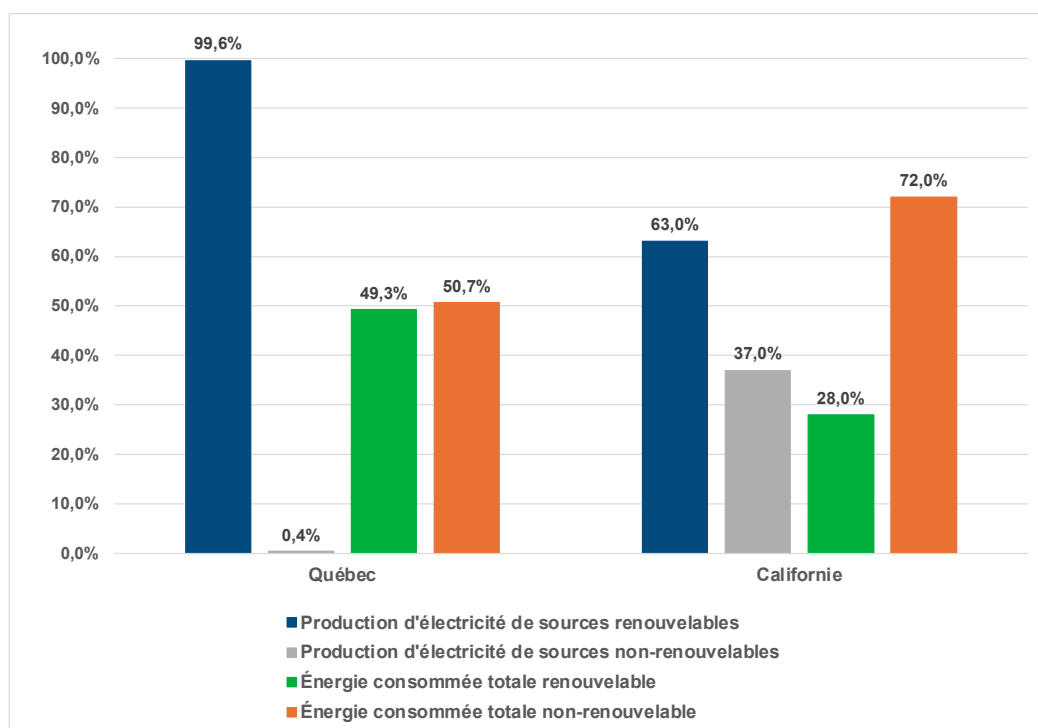
3.2. The Challenge of Capital Flight

The carbon market in which Quebec currently participates with California operates under the SPEDE rules.

Almost all of Quebec's electrical energy comes from renewable sources, mainly hydroelectricity. However, hydroelectricity meets less than half of our total energy needs (Gouvernement du Québec, 2024c).

Even today, about half of the energy consumed in Quebec is of fossil origin and therefore emits greenhouse gases (Gouvernement du Québec, 2024c). California's energy balance is quite different. In fact, 63.0% of its electricity comes from natural gas or coal, with a higher fossil fuel consumption than Quebec, as shown in Figure 1 (California Energy Commission, n.d.).

Graph 1. Share of energy produced and consumed from renewable sources in Quebec (2021) and California (2022).



Sources : Statistique Canada (2024b), G15+ (2024) & California Energy Commission (s.d.)

Another contrast between Quebec and California is the respective size of their economies. As shown in Table 1, the Californian economy is ten times larger than that of Quebec, despite having only four times the population.

Table 1. Economic indicators for Quebec and California, in current Canadian dollars, 2023.

	Quebec	California
GDP	437 G\$	5 300 G\$
GDP per capita	48 556 \$	135 897 \$
Population	9 M	39 M

Sources: Institut de la Statistique du Québec (2024) & Bureau of Economic Analysis (2024)

Quebec companies therefore have access to a much larger and more diversified pool of companies than is available to them in Quebec alone. In addition, some Quebec companies subject to the regulated market purchase at least \$100 million per year in regulated carbon credits produced in the U.S. regulated market (see Appendix 1).

This capital flight represents funds that could have been reinvested locally by Quebec small and medium-sized enterprises (SMEs) to finance domestic emission reduction projects in Quebec. This capital could support Quebec's SMEs in the energy transition by stimulating investment in more ambitious GHG reduction technologies and by creating a local market for carbon credits for companies not subject to the SPEDE.

By limiting local financing options through the purchase of US-generated credits, Quebec risks missing out on economic development opportunities, thereby limiting support for additional local projects. Local SMEs have significant capital needs to innovate and transform their energy and environmental practices, and this capital flight deprives them of an important potential source of financing. These investments could also help boost Quebec's endemic productivity.

3.3. The Issue of Additionality

Around the world, voluntary carbon markets are facing growing concerns about the quality of credits, particularly their ability to truly offset emissions. Doubts have been raised about the additionality and permanence of credits, with critics pointing to the risk of greenwashing if credits do not represent real, additional reductions.

Recently, a petition by more than 60 scientists denounced the ineffectiveness of carbon credits, particularly those from forestry projects, which are said to be holding back the energy transition (The Guardian, 2024b). According to these scientists, only a "true zero" target, not carbon neutrality, could truly prevent the worst effects of climate change³.

The scientists mention that carbon offsets, such as tree planting, are temporary and can be wiped out by forest fires or droughts, releasing stored carbon. They also stress that the standards for projects that can be financed through offsets in this sense must be rigorously determined on a scientific basis. It is also argued that relying on carbon credits without effective emission reductions is risky, as natural CO₂ absorption solutions, such as forests and oceans, are already reaching the limits of their capacity.

³ "True zero" is a complete reduction in emissions, while carbon neutrality still allows emissions to be offset.

Clearly, offset credits are not an uncritical instrument. On the other hand, modulating their operation and parameters to consolidate their effectiveness and combining them with good instruments could consolidate their relevance in the fight against climate change.

Several initiatives, such as the *London Stock Exchange Voluntary Carbon Market Designation* and the *EU Carbon Removal Certification Framework*, aim to strengthen the quality and traceability of credits. These initiatives establish standards for carbon reduction and sequestration credits, making the market more transparent and reducing the risk of double counting (CSIS, 2023).

Carbon credits, when well structured and with robust accountability, can be effective tools for incentivizing companies to reduce their emissions by financing GHG reduction projects (Carbon Growth Partners, 2024). However, this requires verification of the additionality of the resulting projects.

Additionality refers to the fact that the revenues generated by carbon credits play a critical role in the implementation of a carbon project or program. This definition is consistent with the Voluntary Carbon Market's Basic Principles on Additionality, which state that a project is additional only if it "*would not have taken place in the absence of the incentive provided by carbon credit revenues*" (ICVCM, 2024).

Additionality is thus a nuanced component of GHG integrity for a carbon project⁴, as it requires an understanding of the motivations and context behind the development of a carbon project. A multi-dimensional approach to assessment and a healthy dose of judgment are often required to confidently confirm a project's additionality.

For example, a regulation included in the 2023 SPEDE allows large polluters to offset their emissions by planting trees on private land. However, this regulation also allows the creation of offset credits for trees planted as early as 1990, raising questions about the additionality of these "early projects" (Le Devoir, 2023).

Although the carbon sequestered by these trees contributes to the reduction of global warming, it does not represent an effective additional reduction of greenhouse gases. However, the question of additionality of "early projects" remains unresolved among experts.

As a result, additionality is difficult to demonstrate because the intrinsic motivation for a project must be known. The best that can be done to assess this is to examine a range of circumstantial evidence. The more tangible evidence a carbon project provides on each of the additionality factors, the more likely it is to be considered "additional".

Several organizations, known as carbon credit rating agencies (Sylvera, 2023b), have begun providing independent assessments of the GHG integrity risks of a carbon project, including additionality risks.

These additionality problems are much less prevalent in the context of voluntary markets and, indeed, in the case of Quebec, because the sectors not covered (agriculture, landfill sites and forestry) are not susceptible to double counting in connection with the SPEDE.

⁴ Carbon project: A project that reduces or sequesters GHGs and generates carbon credits.

3.4. Carbon Taxes and Additionality

The presence of carbon taxes can complicate matters regarding additionality. These taxes constitute a financial levy imposed by the government on GHG emissions, aiming to internalize the environmental costs of polluting activities. Ecofiscality encourages businesses and consumers to reduce their emissions by making emitting activities more costly.

Carbon taxes and additionality are not in direct opposition. However, the presence of a carbon tax can negatively influence the evaluation of additionality.

The imposition of a carbon tax on SMEs through energy distributors is passed on to all industries. When they reduce their energy consumption and thus their emissions, companies save on the ecofiscal bill of carbon taxes. Consequently, this dynamic ensures that reduction efforts are integrated into the functioning of the regulated market.

This financial incentive to reduce emissions is not always compatible with the strict criteria of additionality in offset credits. Indeed, for a project to be considered additional, it must demonstrate that it would not have been carried out without access to offset credits. However, if a company reduces its emissions following the imposition of a carbon tax, it becomes difficult to demonstrate that the reductions achieved are truly additional, as they can be perceived as a simple response to regulatory requirements.

When companies invest in voluntary GHG reduction projects to go beyond the requirements of the carbon tax, they hope to be able to monetize them in the form of offset credits. However, to materialize these, the projects must meet strict additionality criteria.

It is difficult to demonstrate the true incentive effect of a carbon tax on the development and implementation of GHG reduction projects by companies, as, in general, the level of the tax is relatively low compared to the costs of implementing a GHG reduction project.

While companies may indeed change certain behaviors to reduce the costs associated with the tax (by avoiding an expense), carbon finance represents a direct incentive for companies to invest in projects that have a more significant impact on their carbon footprint.

Even in sectors covered by the SPEDE, the combination of the two measures could create a punishment/reward system (bonus/malus), which would mitigate bad practices and concretely encourage good practices by associating a bonus with them.

3.5. Optimizing Additionality for Greater Climate Impact: The Californian and Quebec Markets

This report previously explained how Quebec is disadvantaged compared to California in a common carbon market, mainly due to the significant size difference between their two economies. It is noted that California has delivered 173 times more offset credits than Quebec, as highlighted in the 7th opinion of the Climate Change Advisory Committee (Gouvernement du Québec, 2024a, p.51).

It is therefore essential to take a closer look at the compatibility of offset credit systems between different jurisdictions, namely Quebec with the SPEDE, and California with the Air Resource Board in terms of additionality criteria.

These two systems, although integrated into a common market under the Western Climate Initiative (WCI), have different approaches and specificities that influence the way GHG reductions are verified and recognized as additional⁵.

A comparison of the additionality criteria of the two systems reveals some similarities, but also a number of notable differences in approach and formalization. This comparison is presented in Tables 2 and 3.

⁵ The SPEDE additionality criteria can be found in the Greenhouse Gas Cap-and-Trade Regulations, sections 65 and 66. For California, these criteria are found in § 95973, “Requirements for Offset Projects Using ARB Compliance Offset Protocols” (California Code of Regulations, n.d.).

Table 2. Similarities in Additionality Criteria between Quebec and California

Criteria	Quebec (SPEDE)	California
Additionality relative to current practices	Projects must reduce emissions relative to a reference period and demonstrate an intensity lower than that of the reference period.	A conservative baseline and standardized criteria ensure that reductions exceed current practices.
Absence of leaks	Reductions must not be offset by increases in emissions at other facilities.	Consideration of the absence of "activity leaks" and "market leaks" to avoid canceling out reductions.
Voluntary nature and absence of regulation	Reductions must be voluntary and not motivated by existing legislation.	Reductions must be voluntary and exceed legal obligations.
Permanence of reductions	GHG reductions must be sustainable.	GHG reductions must be sustainable, with more explicit Californian standards.

Sources : Légis Québec (2024) & California Code of Regulations (s.d.)

Table 3. Differences in Additionality Criteria between Quebec and California

Criteria	Quebec (SPEDE)	California
Reference period and specific reduction periods	Specific eligibility period for early reductions (2008-2011) and reference period between 2005 and 2007.	Flexible accreditation period of 7 to 30 years, without restriction on specific reference years.
Geographic applicability	No explicit constraint, although it is implied that projects are located in Quebec.	Specified geographic limit: United States and American territories.
Establishment of the baseline	Based on past reference periods, without a specific conservative approach.	Conservative approach aiming for a conservative baseline for each project.
Obligations		Include 50% of direct environmental benefits (DEB)

Sources : Légis Québec (2024), MELCCFP (2023) & California Code of Regulations (s.d.)

The previous tables show that the two systems are aligned in their goal of ensuring additional, permanent, and leak-free reductions. However, California is stricter on certain methodological aspects (such as managing permanence in sequestration projects and the conservative baseline), while the SPEDE relies more on fixed reference periods and intensities. The differences are largely due to variations in periods and geographic limits, but the ultimate goal remains similar.

That said, within the framework of the SPEDE, clarifying the geographic limits for projects in terms of additionality would likely help avoid capital flight while strengthening the fight against climate change within Quebec projects.

4. Conclusion

The preceding analysis leads to the conclusion that carbon credits are not a perfect solution or an alternative to internal decarbonization efforts. Indeed, offset credits must always be used in parallel with direct action.

At the same time, it will not be possible to achieve Quebec's climate goals on a sufficient scale and within the required timeframes without a massive increase in the use of offset credits for residual emissions through carbon credits. In this sense, offset credits play the role of an accelerator.

When used well, carbon credits are an essential element of the climate solution, as they finance complementary activities that can produce effective and low-cost emission reductions today, when we need them most³.

In this time of crisis, where time is of the essence, we must not let the perfect be the enemy of the good. The solution is undeniable: companies must both reduce AND offset their emissions. These two options are not mutually exclusive. As United Nations Secretary-General António Guterres said, it is necessary to do "Everything, everywhere, all at once".

The potential benefits of credible offsetting do not stop there. If, as estimated by McKinsey (2021), the value of a reliable voluntary carbon market reached 50 billion US dollars within ten years, this could in itself increase the likelihood of avoiding a climate catastrophe. This is probably why countries endorsed the principle of offset credits at COP29.

Moreover, in the Quebec context, the voluntary offset credit market finances GHG reduction projects carried out in Quebec by SMEs. This annual funding encourages the SMEs concerned to accelerate their transition to a decarbonized economy.

It is increasingly evident that the fight against climate change will require significant and costly efforts as substantial behavioral changes will be necessary. On the other hand, new technologies that can accelerate progress towards carbon neutrality, such as hydrogen fuel cells, battery storage, and direct air capture and storage, are evolving rapidly. However, much of modern life remains anchored in carbon-intensive products and activities, ranging from transportation to agriculture, for which low-carbon alternatives have not yet been found. Moreover, at present, many of these technologies remain theoretical, not available on a large scale, and not economically viable.

Could voluntary carbon markets help ensure the necessary investments for the implementation of these technologies? This would undoubtedly make offset credits a part of the solution towards carbon neutrality.

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6. Appendix 1 - Impact of capital flight on the ecological transition

Offset credits purchased in the United States by entities subject to the SPEDE totaled 13,275,911 units for the 2021-2023 period, as shown in Table 4. The average unit price of these credits was C\$28.93 as of November 6, 2024. Extrapolating to 2024, and assuming stable annual volumes (13,143,303 credits over 3 years, or 4,381,101 credits per year) and unit prices, we can estimate annual expenditures of \$126.7 million.

As a result, Quebec companies that purchase offset credits on the California carbon market are sending nearly \$130 million out of Quebec each year.

This capital flight represents funds that could be reinvested locally to finance emission reduction projects. This capital could also support Quebec's small and medium-sized enterprises (SMEs) in the energy transition and decarbonization by stimulating investment in more ambitious GHG reduction technologies and creating a local market for carbon credits.

Table 4. Statement of offset status - Offset credits used for compliance purposes by Quebec reporting issuers.

Période de conformité	Obligation totale de conformité (t éq. CO ₂)	Crédits compensatoires (t éq. CO ₂)					
		Québec	Californie	Total	Part des crédits compensatoires pour la conformité	Part des crédits californiens sur le total des crédits utilisés	Part des crédits québécois sur le total des crédits utilisés
2013-2014	36 664 703		298 812	298 812	0,8 %	100,0 %	0,0 %
2015-2017	176 145 518	585 134	5 503 021	6 088 155	3,5 %	90,4 %	9,6 %
2018-2020	178 178 929	388 051	13 143 303	13 531 354	7,6 %	97,1 %	2,9 %
2021-2023	176 515 597	366 385	13 275 911	13 642 296	7,7%	97,3%	2,7%
Total des périodes	390 989 150	973 185	18 945 136	19 918 321	5,1 %	95,1 %	4,9 %

Source : Gouvernement du Québec (6 décembre 2024)

By limiting local financing options through the purchase of foreign credits, Quebec risks missing out on economic development opportunities and direct environmental benefits, while limiting support for additional local projects.