

CARBON CONTRACTS FOR DIFFERENCE: Development Considerations for Canada

IETA White Paper



Contents

Introduction 2

Part 1: Carbon Contracts in the Canadian Context 2

Part 2: Exploring Canadian Carbon Pricing Uncertainty & Market Risks 4

Part 3: Carbon Pricing Design Elements in Canada 5

Part 4: Relating Contracts to Market Signals & Risks 8

Part 5: Key Carbon Contract Design Elements 12

Part 6: Risks of Carbon Contracts on Carbon Market Mechanisms 15

Part 7: Solutions to Market Risks 15

Conclusion and Looking Ahead 16

Definitions 17

Introduction

As the leading international business voice on market solutions to tackle climate change, the International Emissions Trading Association (IETA) is well-positioned to outline potential risks, design elements, and carbon pricing system interactions to constructively support ongoing “carbon contract” discussions in Canada. This White Paper aims to inform future development of domestic carbon contracts, underscoring the necessary considerations to accommodate Canada’s unique – but still quite disparate and complex – carbon pollution pricing landscape. For the purposes of this Paper, the term “carbon contract” is used broadly and can describe Carbon Contract for Differences (CCFD) and offtake contracts.

If well-designed, carbon contracts can help de-risk low-carbon private capital, alleviate uncertainties, bolster market confidence, and reduce “stroke of pen” risks. However, it is critical that such instruments be shaped and deployed in a manner that accurately reflect Canada’s unique jurisdictional/project type circumstances, while also respecting the integrity of existing carbon and clean fuels pollution pricing systems. Unintended consequences of improper contract design or integration run the gamut, including: adverse effects on domestic pricing signals, harm to good-faith market practitioners, stranded assets or investments, and even provincial non-compliance with Canada’s federal carbon pricing benchmark. Fortunately, such scenarios can be avoided while most risks can be addressed through carefully designed – and, to a certain extent, “curated” – carbon contract approaches.

Part 1: Carbon Contracts in the Canadian Context

Despite significant improvements over the last year, Canadian regulated emitters, project developers, and clean investors continue to face uncertainty related to longer-term carbon pricing signals and system designs. The most glaring factors linked to uncertainty relate to persistent political and policy or “stroke of pen” market risks. When making decisions on low-carbon capital, companies must judge whether a project developed today will continue to be economic in the future context of Canada’s shifting carbon pricing landscape. Without adequate policy certainty, especially over the mid to long-term, businesses are challenged to make long-term decisions on future investment values and/or compliance pathways. As a result, many are now postponing final investment decisions or looking elsewhere to deploy clean capital.

Well-designed, government-supported carbon contracts (i.e., CCFDs, offtakes) can address uncertainty while attracting large-scale, low-carbon private capital into Canada. In the context of this discussion, these contractual arrangements, between government and business, guarantee carbon price signals remain *sufficiently high, intact, and robust* to support emissions reduction/removal projects. Government-backed contracts indicate a solid commitment to carbon pricing while aiding promotion of large-scale investment, subsequently providing greater confidence in the longevity of carbon pricing systems.¹ Reinforcing confidence in Canada’s pricing systems is imperative to reaching the country’s long-term emissions targets. Recent research from the Parliamentary Budget Officer has suggested that CCFD could directly accelerate up to 40 million tonnes of emissions reductions by 2030.² Proper implementation of CCFDs could play a key role in resolving pricing system uncertainty while helping Canada reach its ambitious national emissions reduction and net zero targets.

¹ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3576402

² https://climateinstitute.ca/wp-content/uploads/2022/10/Closing_the_Carbon-Pricing_Certainty_Gap.pdf

Partly driven by remarkable growth and momentum on compliance carbon pricing, the potential use and benefits of carbon contracts are gaining more attention and traction in Canada and parts of Europe.³ As a result, a diverse and divergent landscape has emerged with varying positions regarding the role, intent, and design of these contracts. Canada’s 2030 Emissions Reduction Plan explicitly states that the Federal Government would explore CCFD as a potential mechanism to *“enshrine future [carbon] price levels in contracts between the government and low-carbon investors, thereby de-risking private sector low-carbon investments [... to create] long-term [carbon price] certainty.”*⁴ This announcement left the business community with wide margins for speculation on the potential role, function, and design of carbon contracts. The publication of Canada’s 2022 Fall Economic Statement (FES) provided further clarification on the implementation of these contract – most importantly creation of the Canada Growth Fund⁵ (CGF) now representing the institutional “home” for Canadian carbon contract design and deployment.

While other parts of the world have seen the successful deployment of these contracts, the fundamental differences in how contracts are designed for the Canadian context must be underscored. In Europe for example, contracts apply within the centralized quantity-based regional cap-and-trade bloc of the EU Emissions Trading System (EU ETS). In Canada, however, a contract available across the country must consider multiple provincial and federal carbon pricing systems that use both price- and quantity-based approaches to carbon pricing.⁶ Therefore, it is imperative that the full scope of potential risks, design elements and nuances of the Canadian context are considered by the CGF in its deployment of carbon contracts. Additionally, it is important to highlight that improper integration of these policy tools can lead to market distortions with short-term and long-term consequences for the carbon price signal.⁷ Given the importance of Canada’s carbon pricing systems in achieving the country’s ambitious climate targets, the CGF must ensure these contracts support projects that reduce emissions in Canada while not disrupting carbon pricing systems.

The risks to carbon pricing systems imposed by CCFDs can be managed – provided risks are appropriately monitored and considered by the CGF, market participants and governments. The path forward for carbon contracts in Canada will require the CGF to evaluate the implications of their contract designs, their allocation method for contracts and the market systems where they deliver contracts.

To comprehensively discuss the design, implications, risks, and benefits of carbon contract deployment across Canada, IETA first explores and defines the risks present in domestic carbon pricing systems (Part 2) and the different mechanisms used in carbon pricing systems (Part 3). In Part 4, we relate contract designs to price mechanisms with a view to demonstrating how different contract designs (as publicly proposed by the CGF) mitigate existing risks in the Canadian context. Final segments of the paper provide general design considerations, potential carbon contract risks and mechanisms to mitigate contract risks.

³ <https://www.europex.org/position-papers/carbon-contracts-for-difference/>

⁴ https://publications.gc.ca/collections/collection_2022/eccc/En4-460-2022-eng.pdf (pg.9)

⁵ <https://www.budget.gc.ca/fes-eea/2022/report-rapport/FES-EEA-2022-en.pdf>

⁶ <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work.html>

⁷ https://climateinstitute.ca/wp-content/uploads/2022/10/Closing_the_Carbon-Pricing_Certainty_Gap.pdf

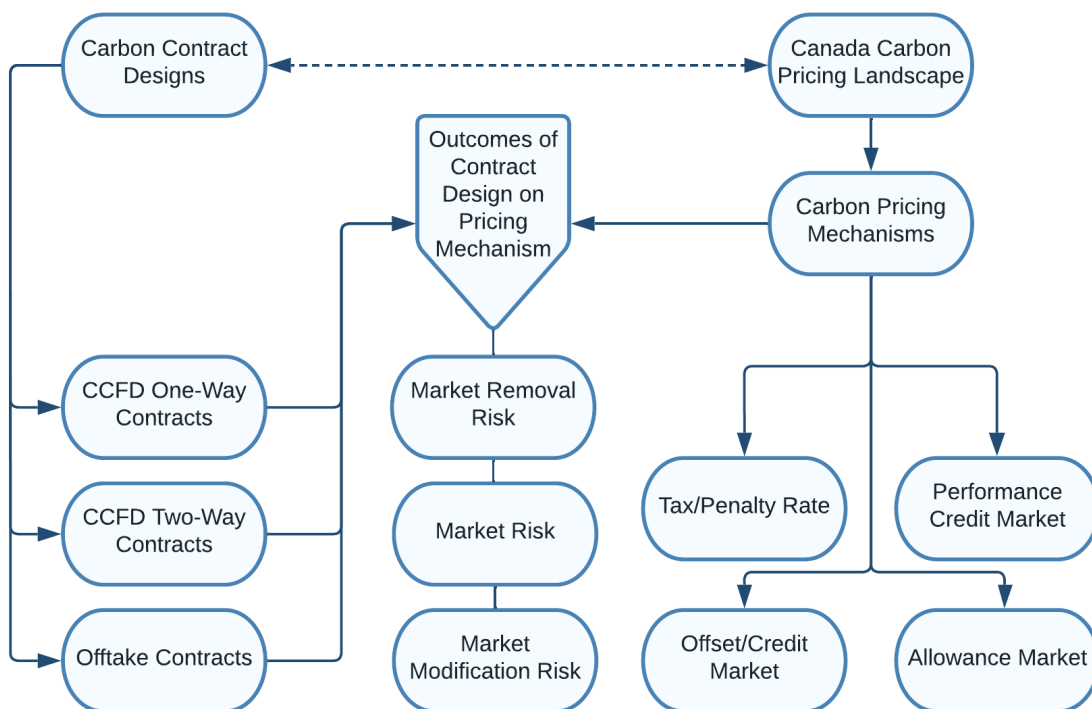


Figure 1: Relating CGF Contract Designs to Carbon Pricing Systems

Part 2: Exploring Canadian Carbon Pricing Uncertainty & Market Risks

In the words of the Federal Government, “carbon pricing is about recognising the cost of pollution and accounting for those costs in daily decisions.”⁸ For regulated emitters, this in practice means undertaking actions and investments to reduce greenhouse gas emissions. The issue is that lack of consistent and reliable policies continues to impede Canada’s ability to attract the sort of private capital needed to finance the climate transition.⁹

A combination of history and outlook for domestic carbon pricing has melded to create an environment of uncertainty. Receiving Royal Assent in 2018, Canada’s Greenhouse Gas Pollution Pricing Act (GGPPA), which forms the legal basis for federal carbon pricing, was challenged by provinces for its constitutionality for nearly three years.¹⁰ This legal uncertainty was reflected in the investment environment, with investors not wanting to bear sunk costs in carbon pricing systems should federal carbon pricing be deemed unconstitutional. The Supreme Court’s final ruling, on 25 March 2021, fortunately provided much needed clarity, upholding and securing the constitutionality of the GGPPA.

⁸<https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/putting-price-on-carbon-pollution.html>

⁹<https://thoughtleadership.rbc.com/the-2-trillion-transition/>

¹⁰<https://www.osler.com/en/resources/critical-situations/2021/supreme-court-ends-uncertainty-over-constitutionality-of-federal-carbon-pricing-framework#:~:text=Writing%20for%20the%20majority%20of,91%20of%20the%20Canadian%20Constitution.>

More recently, carbon pricing systems in Canada were required to be updated in line with the federal benchmark for carbon pollution pricing. A key component of this update was establishment of a price trajectory for carbon pricing to 2030. What remains problematic is the engineering timeframes for many low-carbon projects extend beyond 2030, where there is not pricing or policy certainty.

At the business level, firms are struggling to support the capital expenditure and operational costs of their low-carbon projects because the carbon pricing systems eliciting the price signals are inconsistent, variable, and to a degree undetermined. To understand how carbon contracts can function to mitigate these risks, it is first necessary to characterize core risk types. **These types can be grouped into (3) main carbon pricing-related risks in Canada:**

1. **Market Removal Risk (Risk 1):** A key factor often overlooked in Canada’s carbon pricing systems is that the value derived from low-carbon project development often extends beyond cost avoidance achieved by mitigating compliance obligations. Development of large-scale low-carbon projects, such as carbon capture utilization and storage (CCUS), often requires commercialization of carbon emissions under the governing regulation. This commercialization comes from the generation of various forms of tradable credits within their respective carbon pricing systems. The residing issue is that the value of the product, the credit, only exists as a function of the carbon pricing system. Consequentially, there is a risk that credit generated value will no longer continue to exist in a future should the program no longer exist. For the purposes of this White Paper and analytical framework, this is referred to as “*market removal risk*”.
2. **Market Risk (Risk 2):** The counterpart to generating credits from emission reductions is the volume and prices they are traded or valued within the carbon pricing system. In general, the credit price and volumes are dictated by demand (regulated emitters compliance obligations) and supply of credits within the system. This introduces another risk to the system referred to as the “*market risk*” related to whether the credit or allowance market can absorb reductions achieved by the project at a sufficient price and volume to support the project’s economics.
3. **Market Modification Risk (Risk 3):** The third element of risk present in domestic carbon pricing are physical changes to the carbon pricing systems, referred to throughout this paper as the “*market modification risk*”. Changes to systems can affect the price and volume required for compliance obligations and has trickle-down effects on the prices of traded units.

Part 3: Carbon Pricing Design Elements in Canada

In the initial discussion of carbon contracts in Canada, IETA and the business community focused on the issue of the application of carbon contracts to the carbon pollution pricing systems required as part of the GGPPA. However, recent announcements in the FES have indicated the potential for carbon contracts to extend to other pollution pricing systems including the federal CFR.¹¹

¹¹ <https://www.budget.canada.ca/fes-eea/2022/doc/gf-fc-en.pdf>

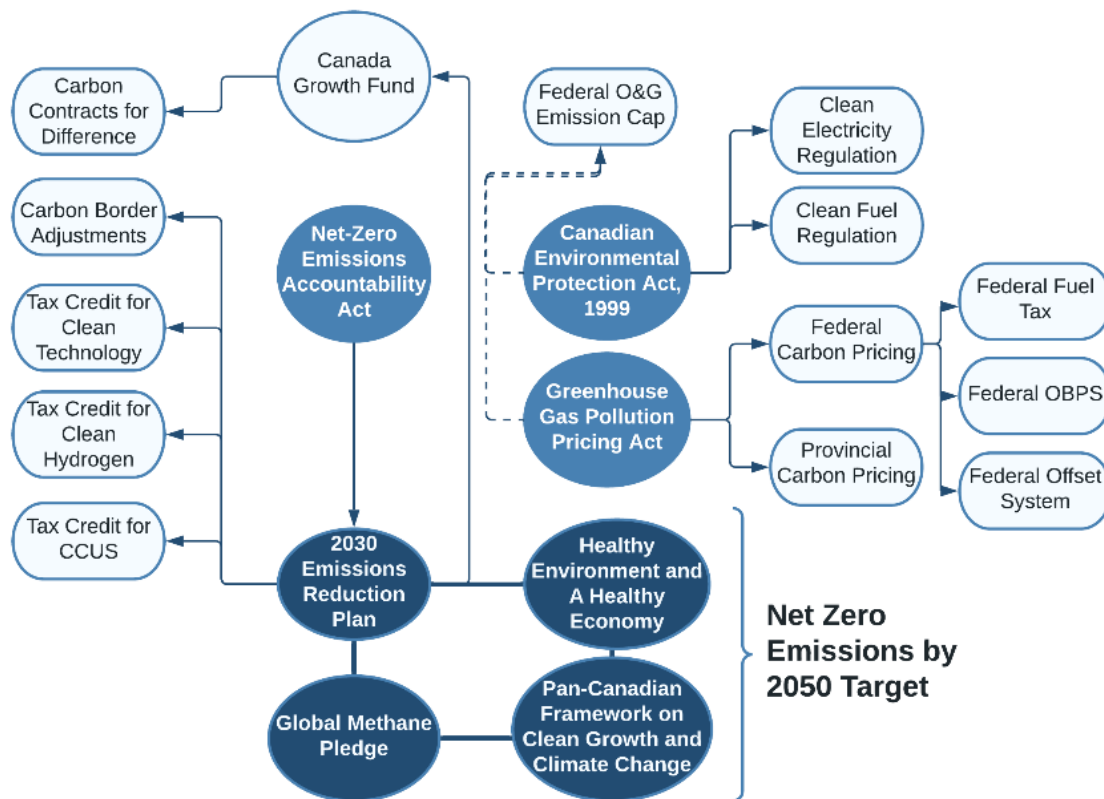


Figure 2: Carbon Pricing Systems and Policies Across Canada

Discussing contracts in this broader context better encompasses various Canadian climate policy and price signals (see Figure 2). While the combination of the CFR and carbon pricing pollution pricing systems creates a complex environment, it also better reflects the realities of developing a low-carbon project domestically (although not all projects would be subject to these regulations). For example, recent amendments to Alberta’s Technology Innovation and Emissions Reduction Regulation (TIER) have created two new asset (credit) classes which allow transition of eligible geological carbon storage offsets to be “stacked” with the CFR. **For the purposes of this analysis and to simplify discussion, both carbon pricing systems and the CFR are referred to as the carbon pricing systems in the remainder of this paper.**

To effectively relate how carbon contracts can be designed for this broad environment, IETA has identified the key **carbon pricing mechanisms** employed within these carbon pricing systems. In Part 4 we relate these mechanisms back to the contract designs revealed in the FES. Categorizing the mechanisms used in carbon pricing systems into groups provides a bottom-up approach that directly connects the implications of contract designs to the various price signals held in carbon pricing systems and subsequently the carbon pricing risks. Additionally, it creates a framework that can help understand the implications of carbon contracts in other forthcoming climate policies like the Clean Electricity Regulation (CER) and the Oil & Gas Emissions Cap. The four categories of carbon pricing mechanisms are defined below.

- **Tax/Penalty Rate:** This rate determines the direct cost of compliance obligations or the penalty that must be paid in accordance with the escalating carbon price legislated by the GGPPA or as dictated in carbon pricing regulation.
- **Offset/Credit Market:** Many systems in Canada use offset and credit markets, wherein credits are issued for emissions reductions occurring from projects designed to a pre-determined protocol or compliance category. These credits may be used as a compliance flexibility mechanism.
- **Performance Credit Market:** To incentivize reductions beyond an intensity standard or industry benchmark, many systems allow the generation of performance credits where emissions or emissions intensities are reduced beyond a specified threshold.
- **Allowance Market:** Exclusive to cap-and-trade systems, allowance markets foster the trading of allowances between regulated facilities. A specific number of allowances are set at the beginning of the compliance period, and their price is limited by a set price floor.

Table 1: Carbon Pricing Mechanisms across Canada

	Output Based Pricing & Emissions Performance Systems							Levy/Tax		Cap and Trade	Federal CFR
Province	ON	AB	SK	NS	NL	NB	Federal OBPS	NT	BC	QC	All
Tax Penalty Rate	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Offset/Credit Market		Y					Y		Y	Y	Y
Performance Credit Markets	Y	Y	Y	Y	Y	Y	Y				
Allowance Market										Y	

Y indicates an incorporated component.

Table 1 outlines the various carbon pricing mechanisms comprising Canadian carbon pricing systems. Carbon pricing systems regulated under the GGPPA are broadly characterized as either price-based or quantity-based. Price-based systems use either a carbon tax, which employs a tax rate on emissions, or an output-based pricing system (OBPS)/Emissions Performance System (EPS) which uses a tax rate on a portion of emissions while allowing for other emissions to be accounted for using performance credits and in some cases offset credits. Quantity-based systems refer to cap-and-trade systems which utilize an allowance credit market and can incorporate an offset market to price emissions. The Clean Fuel Regulation has three (3) different categories of credit generation along the fossil fuel supply chain, crediting markets, that can be used to account for the emissions that a regulated firm generates.¹²

Part 4: Relating Contracts to Market Signals & Risks

In this section, IETA relates how the carbon contract designs proposed by the CGF relate to the specific carbon pricing mechanisms deployed across Canada and consequentially the carbon pricing risks that are addressed.

The three (3) contract types that will be employed by the CGF include:

- 1. Offtake Contracts:** Contracts to provide revenue for a volume of production where sufficient demand from prospective private buyers is still developing.
- 2. One-way Contracts:** When the market price is less than the strike price, the contract would ensure the project receive a payment from the CGF equal to the difference between the strike price and the market price. The CGF can participate in project upside through revenue-sharing warrants.
- 3. Two-way Contracts:** When the market price is less than a strike price (the price that enables the project to meet its target return), the contract would require the project to receive a payment from the CGF equal to the difference between the strike price and the market price. When the market price is greater than the strike price, the CGF would receive a payment from the project equal to the difference between the market price and the strike price.

One-way and two-way contracts are commonly referred to as CCFDs. Together, with offtake contracts, these three contract types are considered “carbon contracts”. It remains unclear which specific market signals and risks would be addressed by each contract design and the consequences of certain contract designs on each carbon pricing mechanism.

The applicability of the contract designs outlined above in relation to the carbon pricing mechanisms summarized in Part 3 are discussed below. **Specifically, we examine this relationship across four (4) existing carbon pricing mechanisms: 1) Tax/Penalty Rate; 2) Offset/Credit Market; 3) Performance Credit Market; and 4) Allowances Market.**

¹²<https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-regulations/compliance.html>

1. Tax/Penalty Rate (*Market Systems: OBPS/EPS, CFR*)

The tax or penalty rate held in carbon pricing systems across Canada is the cost per tCO₂e of the compliance obligation required by a carbon pricing system or the rate that must be paid for non-compliance under the regulation. For example, the current compliance rate in Alberta's TIER system is \$65 per tCO₂e in 2023. Firms develop projects in response to this price signal to avoid paying the cost of the penalty or tax rate. The price signal is subject to stroke of pen risks from subsequent governments making changes to the price signal (Market Modification Risks). The implications of different contract designs on the tax/penalty rate carbon pricing signal are summarized below.

One-Way Contract

A one-way contract serves to safeguard the price signal held in a compliance system that motivates project development. An able firm would choose to develop a low-carbon project if it would cost them less over time than paying the tax on their emissions. For example, suppose a project takes a one-way contract that reflects the federal benchmark price schedule (i.e., increasing to \$170/tCO₂e by 2030), but prices are reduced to \$60/tCO₂e in 2025 due to a political change. In this case, it would be cheaper to pay the tax than continue to operate the project, rendering the project stranded. However, a one-way contract would require the CGF to pay the difference between the new price and the benchmark price locked in from the contract. As a result, the carbon contract safeguards the market modification risk and continues the operation of the project.

- **Emission Reduction Owner:** Project Proponent
- **Risk(s) Addressed:** Market Modification Risk

Two-Way Contract

A two-way contract can be used to provide an upside for the CGF in addition to the downside risk protection for the project developer, described above in the case of a one-way contract. For example, in a situation where the price changes instead to \$200/tCO₂e, the firm as a result now has additional benefit from avoiding a higher cost of compliance through the project. But the firm would then pay the difference between the new price and old price to the CGF on each tonne it reduces.

- **Emission Reduction Owner:** Project Proponent
- **Risk(s) Addressed:** Market Modification Risk

Offtake Contract

An offtake contract is best deployed where there is already a serialization and accounting mechanism established for low-carbon projects. While offtake contracts can be written to support tax/penalty rate markets, they are better suited elsewhere.

2. Offset/Credit Market (Market Systems: OBPS/EPS, CFR, Cap-and-Trade)

Offset and credit markets are components of industrial carbon pricing, cap-and-trade systems, the CFR and potentially the upcoming CER. These markets provide a mechanism for regulated emitters to fulfil their compliance obligations and can be traded. The prices in these markets are subject to volatility, a consequence of supply and demand, compared to the tax/penalty rate which is pre-determined. Credits are generated through protocols or within compliance categories to be used by facilities for compliance or to be sold in the credit market.

One-Way Contract

One-way contracts can serve two purposes in offset/credit markets. First, a contract can be used to safeguard the price in the case of modifications to the pricing structure within carbon pricing systems. Traded units tend to be valued near the tax or penalty rates or price limits within the system, and changes to these rates have direct consequences on market prices. A one-way contract can ensure that if carbon pricing system prices are changed and prices fall below a pre-determined strike price the project could be compensated. As a result, safeguarding against the market modification risk. Second, a contract could be used to safeguard against the volatility of the market. The CGF could write a contract that guarantees the price received for the offset or credit units produced by the project in the market. Regardless of either approach, careful monitoring must occur to ensure that gaming of contracts does not occur. Since units are traded over-the-counter (OTC) and pricing data is private and opaque adverse incentives exist from prevalent asymmetric information.

- **Emission Reduction Owner:** Offset/Credit Buyer
- **Risk(s) Addressed:** Market Modification Risk, Market Risk

Two-Way Contract

Two-way contracts have an analogous function to the one-way contract with the added provision of additional benefits to the CGF in the case that prices are revised upwards above a pre-determined strike price when the market is modified, or the market price rises above a pre-determined strike price. Similar caution will have to be undertaken if the CGF writes contracts guaranteeing market price of contract.

- **Emission Reduction Owner:** Offset/Credit Buyer
- **Risk(s) Addressed:** Market Modification Risk, Market Risk

Offtake Contract

An offtake contract removes supply of offsets or credits from the market system and instead sells them to the CGF for a guaranteed price, removing the market risk. A stipulation of these contracts could be engagement only when markets are removed, insufficient volume can be sold, prices fall below a certain threshold or when prices fall below a threshold because of a modification to the systems price. As a result, addressing the market removal risk, market risk, and market modification risk, respectively.

- **Emission Reduction Owner:** Canada Growth Fund
- **Risk(s) Addressed:** Market Risk, Market Removal Risk, Market Modification Risk

3. Performance Credit Market *(Market Systems: OBPS/EPS)*

Performance credits are a fundamental component in OBPS and EPS systems. These credits are awarded to companies when emissions are reduced beyond intensity or industry benchmarks. These credits can be used to meet compliance obligations and can be traded amongst facilities. When companies undertake efforts to reduce their emission beyond their intensity standards or compliance obligations the generation of performance credits is one of the mechanisms where costs can be recovered.

One-Way and Two-Way Contracts

The function of one-way and two-way contracts is entirely analogous to the behaviour in the case of offset and credit markets. Similar caution needs to be undertaken when writing contracts that supports pricing between transactions between regulated emitters as these markets are OTC with opaque pricing.

- **Emission Reduction Owner:** Offset/Credit Buyer
- **Risk(s) Addressed:** Market Modification Risk, Market Risk

Offtake Contracts

Offtake contracts are also suitable in this context given the robust serialization process of emission reductions. Similar stipulations, as outlined in the case with offsets credits, can be applied in this context.

- **Emission Reduction Owner:** Canada Growth Fund
- **Risk(s) Addressed:** Market Modification Risk

4. Allowance Market *(Market Systems: Cap-and-Trade)*

In cap-and-trade systems, emission allowances (permits) are auctioned by the regulator and traded amongst companies during compliance periods to meet compliance obligations. Regulated emitters can undertake emission reduction projects to reduce their total emissions, reducing the number of allowances they must buy (in some cases completely) and/or enable them to sell excess and free allowances. The value of a project in a cap-and-trade system is facilitated through avoided costs and revenue generated by selling excess/free allowances. Where avoiding costs, low-carbon projects function similar to the tax/penalty rate case, with the key difference being a variable market cost on emissions rather than a pre-determined rate. So one-way and two-way contracts function analogously to the case outlined above, with the exception of addressing market risk rather than market modification risk. The discussion below focuses on implications where a project facilitates the sale of excess and/or free allowances.

One-Way Contract

A one-way contract guarantees that emission permits are sold at a minimum price, providing the needed certainty to undertake a low-carbon project. Since allowances are traded in a market where no backstop price is required there does not exist the same incentive to game margin-based contracts.

- **Emission Reduction Owner:** Allowance Buyer
- **Risk(s) Addressed:** Market Risk

Two-Way Contract

A two-way contract locks in the price of the allowances that supports the low-carbon project providing the CGF with funding when prices rise above the predetermined strike price and the company the required funding to support the project when prices fall below.

- **Emission Reduction Owner:** Allowance Buyer
- **Risk(s) Addressed:** Market Risk

Offtake Contract

An offtake contract for emission permits is not suitable for a cap-and-trade system as such a contract would introduce a greater scarcity of emissions permits, effectively tightening the emissions cap. However, a market removal clause included in one of the CCFDs could require the purchase of a portion of a given project's emissions reductions in the case of market removal.

Culminating our above analysis highlights the impacts that proposed contract designs can have on different carbon pricing system mechanisms. For example, a one-way contract applied to a tax or penalty rate has the effect of managing the modification risk whereas applied within an allowance market it has the effect of addressing the market risk. It will be critical for both project developers and the CGF to consider the resulting outcomes of these contract designs to best inform how they may work in practice across Canada's diverse carbon pricing landscape. Presently, it is not clear where and how the CGF will look to ensure that the price signal is held in these market systems. This should be a key discussion item with inception of the CGF. Coordination with industry will be critical to ensure that the overarching design principles of carbon contracts work to enable low-carbon project deployment domestically.

Since domestic carbon pricing systems are constituted of several different carbon pricing mechanisms, it may be the case, that to sufficiently safeguard the risks of development for a low-carbon project, a combination of one-way, two-way and offtake contracts would have to be deployed. The analysis above provides robust starting point for understanding the implications of more complex carbon contract designs. We expect that further discussion on the design and implementation of carbon contracts will be required between project developers and the CGF.

Part 5: Key Carbon Contract Design Elements

In addition to the carbon contracts proposed by the CGF, there are several key design considerations and overarching best practices to incorporate into the design and function of carbon contracts. We consider the factors identified and discussed in Table 2 as critical for creating contracts which: maximize economic value, mitigate distortive effects, and lead to high volumes of emission reductions and clean capital deployment.

Table 2: Design Elements and Considerations for Carbon Contracts

Design Element	Discussion
Incentive Structures	Determination of the targeted price signals that the CGF will safeguard will be critical to establish for market participants. As we have demonstrated, projects can face multiple price and market signals that facilitate the value creation for the project. Determining whether multiple or single price signals are safeguarded in these contracts is necessary for determining the economics of a project.
Project Risk Profile	Projects backed with public funding must have a high emissions reduction potential with a tolerable probability of success to maximize the value for the project proponent and the environment. Projects need to be based on proven, demonstratable, and deployable technology/science to maximize the likelihood of reaching Canada’s climate targets, a goal of the CGF. ¹³
Dynamic Pricing	Dynamic pricing can be integrated to mitigate issues of surplus or deficit of state supplied aid as required to support a project’s development. A responsive contract allows greater tolerance to movements in carbon and commodity markets that are critical to a project’s development. ¹⁴ For example, the Stimulation of Sustainable Energy Production and Climate Transition Subsidy in the Netherlands supplies funding based on the carbon price in the EU ETS ¹⁵ .
Volume Requirements	Requiring a predetermined volume of emissions reductions from a project could function as a safeguard for both the government and the project developer. First, having a set volume requirement backed by pricing certainties would solidify a project’s financial viability. Second, by having volume requirements, the CGF creates accountability for delivering emissions reductions. The fund should be cautious that it does not introduce competitiveness concerns or perverse incentives through its volume requirements.
Duration	Contract duration should recognize the unique cost and scales of a low-carbon project. Incorporating future extensions to the federal backstop price schedule will be critical as presently there is no indication of the price trajectory beyond 2030. Additionally, it will be critical for the CGF to establish whether it will support contract durations beyond 2030.
Coordination with Other Funding	Contracts need to consider additional funding that a project receives to ensure that public funding is appropriately allocated and used in an efficient and compatible manner.
Contract Liquidity	While CCFD and offtake contracts function similarly to other financial instruments, the contracts do not hold the same liquidity because carbon contract development is tied to the development of a low-carbon asset. In practice, transferring carbon contracts to another project is not a seamless or necessarily straightforward process. Even in the case where projects are based out of the same offset protocol, variations between projects would require high degree of assessment to transfer contracts. Additionally, there will need to be consideration for how projects interact under overlapping carbon pricing systems. For example, emissions reductions from a CCUS facility could contribute towards TIER and the CFR at the same time.
International Trade Concerns	We highlight two international considerations the CGF will need to be conscientious of in their contract designs. First, contract design must consider the principles of the World Trade Organization. Carbon contracts will need to be designed to avoid unfairly advantaging domestic industries in a manner that results in dumping or otherwise aids the competitiveness of domestic industry. ¹⁶ Second, contract design needs to be adaptive to potential developments to Europe’s Carbon Border Adjustment Mechanism (CBAM) and the conference of parties’ Article 6 rulebook. Carbon border adjustments are based on the robustness and stringency of the domestic carbon pricing measures. Carbon contracts that are too advantageous to domestic industry may result in negative trade outcomes from the CBAM. Additionally, credits generated from these contracts may be suitable to be traded outside of Canada. When the Federal Government determines if these credits can be sold internationally it will be critical that the CGF is responsive to the potential new market dynamics.
Mitigating Competitiveness Concerns	Determining how contracts are awarded is essential for ensuring contracts mitigate negative competitiveness and market impacts. Any system that awards contracts to select companies within a compliance framework risks domestic and international competitiveness concerns. It is also notable that Emissions Intensive Trade Exposed (EITE) protected industries will likely be particularly interested in carbon contracts to maintain competitiveness while reducing emissions. As current and new federal policies increase stringency, carbon contracts offer a potential incentive to spur investment in these sectors.

¹³ <https://www.budget.gc.ca/fes-eea/2022/report-rapport/FES-EEA-2022-en.pdf>

¹⁴ https://www.agoraenergiemwende.de/en/publications/?tx_agorathemen_themenliste%5Bprodukt%5D=2077&cHash=444471a2c0fbd6fc99a403410d8a8266

¹⁵ <https://www.catf.us/2020/12/sde-netherlands-eu-decarbonization/>

¹⁶ https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm

Table 2: Design Elements and Considerations for Carbon Contracts

Design Element	Discussion
Emission Reduction Owner	Determining who owns the rights to claim the supported emissions reductions is critical for contract design. Where offtake contract contracts are used, it will be necessary to establish who the owner of the emissions reductions are and who can claim credit to those reductions. Failure to do so could lead to double counting and missed compliance obligations.
Contract Initiation Fees	A potential mechanism for contracts is to require an upfront payment for the contract, similar to financial system futures and options. Holding a price for the contract would also facilitate finding a willing and able buyer to take on the contract.
Market Removal Clause	A critical stipulation of contracts could require that the government purchase the emissions reductions achieved by a project where a market system no longer continues to operate. This clause would provide certainty that key low-carbon projects do not become stranded assets if market systems undergo dramatic changes in Canada.
Termination Clause	A key clause that must be included in carbon contracts will be an exit clause for the project developer and government. Often external factors can escalate or change to make the development of a low-carbon project uneconomical or not meet its emissions reduction targets. The CGF may consider including a de minimums threshold for emissions reduction delivery and where that is not met by a project could lead to termination.
Contract Transfer Clause	Another key clause would allow a low-carbon project owner with a carbon contract to transfer the contract from one party to another if the sale of the asset occurs.

Beyond these key design elements and considerations, ensuring that carbon contracts are written in a manner that jointly captures the **financial and environmental value** is critical. Examining the relationship between these two streams of value elicits an overarching principle to effective contract design.

The first stream of value is the **financial value** of the project’s development within the carbon pricing system. Whether the project is developed to lower compliance costs or to generate revenue, the pricing mechanism creates value for regulated emitters and market participants to develop low-carbon projects.

The second stream of value is the **environmental value** captured when greater volumes of emissions over longer periods of time are reduced because of the low-carbon projects operation.

These two value streams are dependent on one another: the more emissions reductions achieved by a firm’s low-carbon project, the greater the environmental benefits. However, as the scale of these projects increase, so does the risk profile of the project within the carbon pricing system. Therefore, an overarching principle of effective contract design guarantees that sufficient volumes of emissions reductions are valued at sufficiently high prices over a long enough period to ensure the financial and environmental value of a low-carbon project is captured. It is of the greatest value to the environment if greater volumes of emissions are reduced as the result of a projects development – and it is of the greatest value (to the firm) if reductions achieved hold financial value that can outweigh the cost and risk of development.

Value is further captured by virtue of having many contracts signed by the CGF and when market impacts are appropriately managed. Carbon contracts supported at sufficient prices, volumes and durations creates greater market confidence for other market participants and investors. This confidence can translate into greater volumes of reductions stimulated through the market systems. These extended benefits are highly provisional on whether the associated risks of carbon contract development are managed. The risks of carbon contracts deployment are discussed in Part 6.

Part 6: Risks of Carbon Contracts on Carbon Market Mechanisms

Improper integration and aggregate deployment of carbon contracts could lead to market distortions and short-term and long-term consequences for the carbon price signal coming from market-based mechanisms. Caution and consideration of the unintended consequences must be at the forefront of the implementation phase of these contracts. Further, it will be important for the CGF to wholistically consider possible market distortions arising from contract deployment.

Two key market impacts can arise from the aggregate deployment of carbon contracts.

1. First, a **negative demand shock** can occur when firms no longer demand compliance units, caused by contracts enabling a portion of the market to fulfil compliance obligations.
2. Second, a **positive supply shock** can occur where firms increase the supply in credit, performance, and offset markets with emissions reductions achieved by funded low-carbon projects.

Compounding a negative demand shock with a positive supply shock is concerning, as it could lead to further depressions of carbon market prices. It is **imperative that the implementation of carbon contracts does not diminish the prices held in the compliance markets of provincial industrial carbon pricing systems.**

Importantly, it is a federal requirement in meeting the updated federal benchmark that the marginal price signal in these market systems be held sufficiently high and that there exists *net compliance demand* within the carbon pollution pricing system.¹⁷ A strong price depression or situation of greater compliance supply than demand could result in a situation of provincial non-compliance with the federal benchmark requirements and potential negative effects during Canada’s next carbon pricing interim review.¹⁸

Part 7: Solutions to Market Risks












Despite potential negative consequences of contract deployment in Canada, there are several tools, best practices, and actions to mitigate the risks described above.

Table 3 summarizes the potential solutions to the market risks. The last column, “Acting Body”, highlights the most likely or suitable government actors to deploy the market risk solution.

¹⁷ <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/carbon-pollution-pricing-federal-benchmark-information/federal-benchmark-2023-2030.html>

¹⁸ <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/carbon-pollution-pricing-federal-benchmark-information/federal-benchmark-2023-2030.html>

Table 3: Potential Solutions to Carbon Market Risks

Mechanism	Description	Supply Tool	Demand Tool	Acting Body
Forecasting & Market Requirements	When writing contracts, it will be vital to consider the forecasted emissions for regulated facilities in the market as this will fundamentally dictate the demand in the market. Additionally, having insights into the project pipeline will be critical for ensuring that project development does not saturate the market and establishing future expectations.			CGF
End Credit Flows	It will be vital to consider where the emissions reductions are accounted for from a low-carbon project. There needs to be a clear understanding of the number of credits that will be supplied into the various carbon pricing systems.			CGF, Project Developer
Volume requirements	Having volume requirements in contracts can help create future supply and demand certainty in the market. Knowing the expected number of credits to be generated at different points in the future can help with forecasting to regulate the supply and demand of credits in the market.			CGF
Offtake Contracts	Offtake contracts can be used to siphon offsets from credit markets to ensure that the price signal within these market systems continue to be held.			CGF
Market Linkages	Market linkages provide a means of greatly expanding the demand for credits. Additionally, since carbon pricing systems are required to be held to a similar level of coverage, stringency, and pricing, there does not exist perverse incentives for credit transfers between systems. While reasonable limitations would be required here, cap-and-trade systems would not function well if linked with OBPS/EPS systems, most carbon pollution pricing systems in Canada utilize an OBPS/EPS.			Provincial and Federal Governments
International Markets	The largest market for expansion is international. Provincial/Federal Governments should continue exploration into where markets can be expanded internationally and in alignment with Article 6 of the Paris Agreement.			Provincial and Federal Governments

Conclusion and Looking Ahead

Carbon contracts, proposed by the CGF, can be effectively implemented to de-risk low-carbon private capital, alleviate uncertainties, bolster market confidence, and reduce “stroke of pen” risks. However, as this Paper and above analysis demonstrate, carbon contracts must be carefully designed to suitably reflect Canada’s unique carbon pricing system landscape while preserving – if not enhancing – the longer-term integrity and efficacy of these existing pricing mechanisms. Looking ahead, the CGF, Federal/Provincial Governments, and Canadian business stakeholders have much to consider as decisions and actions on carbon contracts in the Canadian context evolve through 2023.

Definitions

- **Low-Carbon Project:** A project that reduces the regulated emissions or can be attributed towards the reduction of a compliance obligation of a facility under the governing carbon pricing system.
- **Carbon Pricing System:** Federal or provincial regulation that uses a price or market signal to incentivise emissions reductions from regulated firms. This definition includes provincial and federal carbon pollution pricing systems required as part of the Greenhouse Gas Pollution Pricing Act and the Clean Fuel Regulations.
- **Carbon Contracts:** Carbon contracts are an agreement between governments and businesses that guarantees that the price signal from carbon pricing systems is sufficient to incentivize the development of a low-carbon project. Together offtake contracts and CCFD are taken together to define carbon contracts for the purposes of this paper.
- **Offtake Contract:** Contracts providing revenue for a volume of production where sufficient demand from prospective buyers is still developing.
- **Carbon Contract for Difference (CCFD):** A type of carbon contract that uses a strike price to ensure that prices remain sufficiently high to support the development of a low-carbon project. There are two types of CCFDs in consideration for the purposes of this paper, one-way and two-way contracts.
- **One-way Contract:** A type of carbon contract for difference that protects the holder from decreases in the carbon price below a pre-determined strike price.
- **Two-Way Contract:** A type of carbon contract for difference that protects the holder from decreases in the carbon price below a pre-determined strike price and provides the contract counterpart with an upside benefit when prices rise above a pre-determined strike price.
- **Carbon Pricing Risks:** A characterization of the uncertainty present in the Canadian carbon pricing environment that highlights three key risks. These risks include the market removal risk, the market risk, and the market modification risk.
- **Market Removal Risk:** The risk that the value of the credit or emissions reduction within a carbon pricing system will no longer exist in a future period.
- **Market Risk:** The market risk is whether the credit or allowance market can support the emissions reductions achieved by the low-carbon project at a sufficient price and volume.
- **Market Modification Risk:** The risk that a carbon pricing system will undergo a change that affects the compliance obligation of the regulated emitter, or the price held in the carbon pricing system.