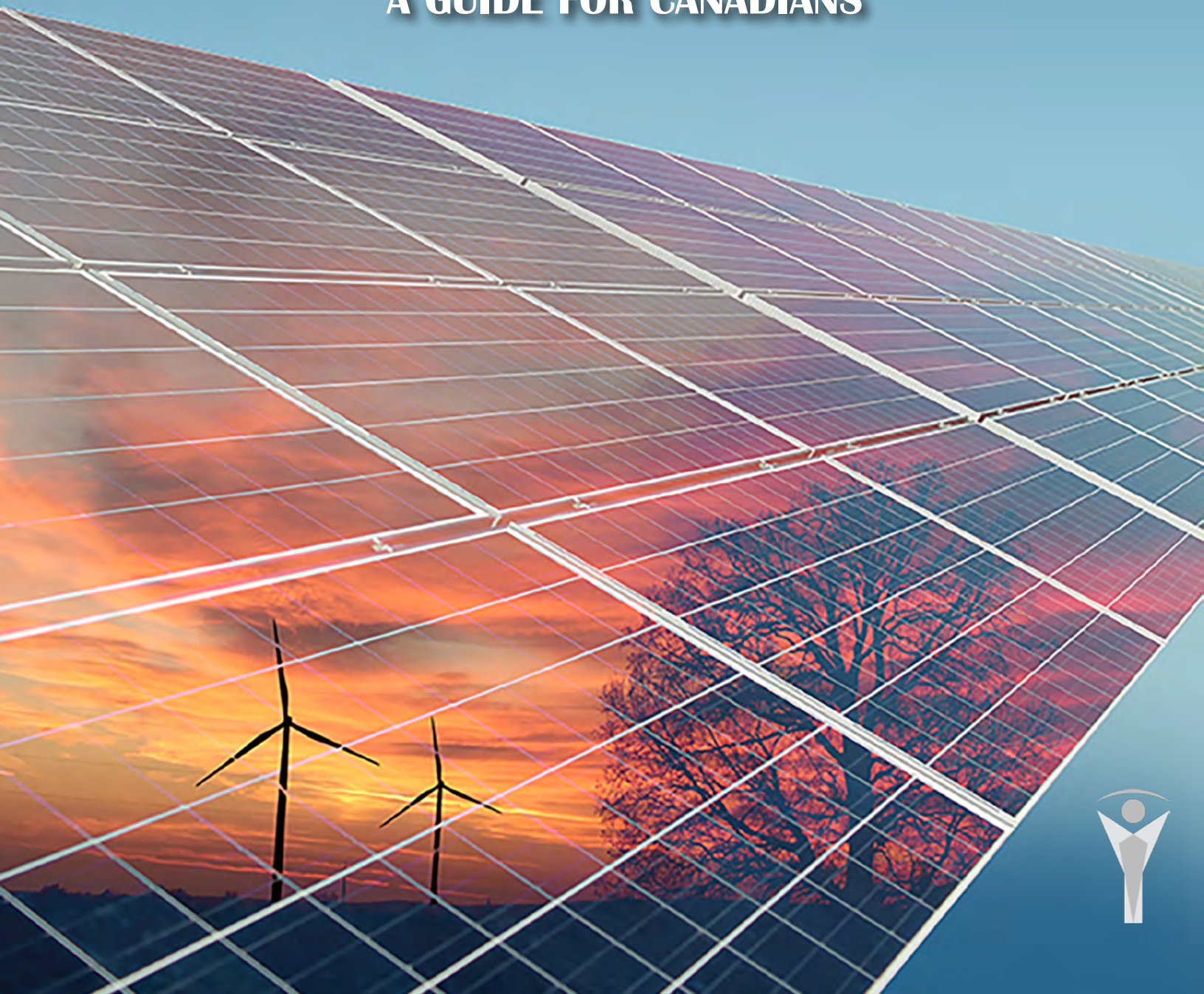
CARBON OFFSETS

A GUIDE FOR CANADIANS



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What are Carbon Offsets?

Rising atmospheric greenhouse gas (GHG) emissions, including carbon dioxide (CO_2), is undermining the overall health of the planet's ecosystems while increasing the frequency and the severity of extreme weather events. In order to minimize the negative impacts of climate change, every effort must be made to, on the one hand, transition away from the production and consumption of fossil fuels – which are the primary cause of rising GHG emissions – and on the other hand, to remove GHGs that have accumulated in the atmosphere due to human activity and from the beginning of the industrial revolution.

Towards these policy objectives, *carbon offsets* will play a critical role as quantifiable reductions in CO_2 and other GHG emissions that:

Are achieved from projects and programs that avoid, reduce or remove GHGs from the environment;

and

Can be used to compensate for the emissions of polluters, including the private sector and individuals.

Carbon offsets are typically represented as units of *carbon credits* – a verified volume of CO_2 and equivalent volume of other GHGs (i.e., CO_{2eq}) – that have been removed from the atmosphere against a pre-defined target(s) or along a desired baseline(s).

Both natural and so-called 'artificial' offsets can result in credit generation, although different jurisdictions will restrict the type of activities eligible under their respective systems:

- The storage of CO_2 in natural carbon sinks like forests and wetlands (e.g., conservation and restoration of natural landscapes such as forests);
- Energy efficiency projects that result in reduced GHG intensity and/or emissions;
- Investment in renewable energy production to displace fossil-based fuels (e.g., wind farms, small hydro, biomass, geothermal, solar energy and alternative fuels);
- CO_2 and methane (CH_4) capture and utilization (e.g., from landfills or livestock); and,
- Phase-out of potent short-lived GHGs (e.g., chlorofluorocarbons and halons) that damage the ozone layer, can contribute to air pollution, and increase the pace of climate change.

Carbon offsets should not be treated as a license to pollute but rather characterized as a *substitute* for GHGs already emitted and *credited* for emission reductions that would not have been achieved otherwise. Moreover, in order to minimize the impacts of climate change, every effort must be made to accelerate the transition away from activities that result in GHGs and to-wards cleaner sources of energy production and use.

HOW DO CARBON OFFSETS WORK?

Under carbon pricing regimes, for example, in jurisdictions where industrial emissions are capped and firms are required by legislation to meet specified GHG reduction targets, government-issued carbon credits can be purchased by companies to substitute for direct emissions removal (under what are often called 'cap-and-trade' programs). Companies who over-comply with their target can sell surplus credits to higher-emitting operators who need them. For these underperforming firms, the credits provide a way of neutralizing the CO_2 and other GHGs that their activities emit. Because they work essentially like tradeable permits, these are called *compliance credits*. However, such credits need to be distinguished from *offset credits* generated through voluntary activities (i.e., emission reductions that have taken place outside of regulatory requirements) and that are usually bought and sold through trading platforms and brokers.

Private sector entities can buy carbon credits from voluntary offsets achieved through, for example, non-polluting energy production or carbon sequestration activities. Industrial buyers of offset credit benefit from purchased GHG reductions resulting from carbon offset activities when such credits are attained at a lower cost than facility-level emission reductions. Sellers of carbon offsets, on the other hand, benefit directly from new investment in their projects (i.e., afforestation, renewable energy production, etc.).

The value of natural carbon offsets is determined by calculating the amount of carbon stored in biomass (i.e., in trees, soils and natural areas) using internationally-accepted quantification methodologies,[1] and credits are generated as living systems remove carbon from the atmosphere and store it (until the biomass decomposes, is harvested or lost to fire). Because the carbon sequestered in natural ecosystems is only temporary, our forests, wetlands and farm soils count as both carbon sinks and sources, with actual carbon storage differing from year to year depending on factors such as the prevalence of forest fires, the level of insect activity and changes in forestry practices (van Kooten and Johnston, 2016). For decarbonization projects, the value of credits is determined by pricing the carbon that is sequestered or removed from the environment (e.g., under carbon pricing regimes) or the per tonne cost of emission reductions achieved as a result of a switch from a fossil fuel-based activity to a lower or zero emitting energy project.

[1] Widely used quantification methodologies include the *Greenhouse Gas Protocol* published jointly by the World Resource Institute (WRI) and World Business Council on Sustainable Development (WBSD), as well as the *International Standard Organization* (ISO) *14064-2 Standard*.

INTERNATIONAL CARBON OFFSETS

The root of modern day international climate agreements, requiring signatories to implement emissions reduction measures, can be traced back to the 1992 Rio Earth Summit. The first of such agreement came six years later in 1997 through the adoption of the Kyoto Protocol that in turn came into force in 2005. It introduced binding requirements for industrialized nations to reduce their GHG emissions. Article 12 of the Kyoto agreement also established the first truly global market for emissions trading, with the Clean Development Mechanism (CDM) and a provision for Joint Implementation intended to help state parties meet their targets with international credits. The CDM allowed industrialized countries to invest in GHG mitigation projects approved by the designated national authorities in developing economies, in order to earn tradeable certified emission reduction (CER) credits that would count towards their Kyoto obligation. Joint Implementation allowed industrialized countries to meet a proportion of their obligation by offsetting carbon pollution in other industrialized countries, with credits called emission reduction units (ERUs).

Although these emissions offset instruments have helped to support investment in renewable energy and efficiency measures to reduce GHGs in various places, the use of CERs in particular has been limited by the rules of important carbon markets like the European Union's emissions trading system (the 'EU ETS'). The EU legislation introduced in 2005 imposed maximum limits on regulated emitters' use of international credits for compliance, and since 2013 has required each operator to exchange its CERs and ERUs for EU allowances (up to a specified entitlement limit), which are tied to the EU's overall emissions reduction target. What is more, the EU has upheld restrictions on potentially high-value offsets like afforestation and reforestation activities in the land use, land-use change and forestry (LULUCF) sector, both in response to the concerns of conservation groups and due to persistent problems with project oversight in developing countries and economies in transition. Beyond 2020, the EU plans to discontinue the use of such international credits but will continue to explore opportunities for linking carbon markets.

International negotiations that culminated in the 2015 signing of the Paris Agreement has the potential to provide a more robust and integrated framework for an international carbon offset market. Under Article 6 of the Paris Agreement, provisions are made for the use of 'internationally transferred mitigation outcomes' (ITMOs) (i.e., emission reductions that take place in another jurisdiction) towards a country's nationally determined contributions (NDCs) (i.e., domestic climate commitments). For example, the governments of the U.K., Germany, Canada, Sweden, Norway and Switzerland have already begun preparing carbon trades under the World Bank Group's Transformative Carbon Asset Facility (TCAF),[2] a collaborative finance initiative that directly supports the design of offset mechanisms and purchase of credits in both industrialized and developing economies. Where the older carbon market created under the CDM, for example, was effective in driving investment cleaner energy production in emerging economies, Article 6 of the Paris Agreement is expected to have a broader coverage.

In-line with the emerging opportunities for credit generation, the international community will need to continue policies that reduce the production and use of fossil fuels while devising innovative ways to remove atmospheric CO_2 that have accumulated since the industrial revolution and from human activity. These efforts need to be led by industrialized nations that have both the means and are responsible for the historical emissions. In turn, industrializing jurisdictions will need to implement the kind of high-value offsets made possible with the adoption of cleaner technologies, which are often realized at a lower cost than in industrialized nations. By sustaining their own low-cost offsets for their GHG mitigation commitments and receiving support for higher-value projects, governments in industrializing jurisdictions can ensure a steady rate of emissions reduction that matches their level of ambition and flow of capital that support decarbonization objectives.

[2] Valued at over USD 200 million of participating government investment currently and with a target to raise 500 million in private financing, the TCAF is but one example of governments responding to the new demand for carbon markets. As offset projects and programs are selected for its support, the TCAF has the potential to unlock as much as USD 4 billion in UN-directed climate mitigation potential (Carr, 2018).

CANADA'S DOMESTIC CARBON OFFSET SYSTEM

Canada's existing system of GHG reporting requires that the federal government track national GHG sources as well as carbon storage and removals in its National Inventory Report, submitted under UNFCCC reporting requirements. Like other jurisdictions, Canada also reports on its efforts to achieving its climate commitments under the Paris Agreement.[3] Primary sources of Canada's GHG emissions going forward are expected to be energy production (the expansion of oil sands sector in particular) and transportation related emissions. Its natural landscapes, on the other hand, can act as both a source of GHG emissions (i.e., resulting from forest fires, insect infestations, wetlands drainage and deforestation) and as a means for the removal atmospheric CO_2 (i.e., through appropriate afforestation and wetland conservation efforts).[4] Conservation efforts aimed at restoration and protection of Canada's natural landscapes that go beyond regulatory requirements can offer significant opportunities for domestic offset creation and the sale of such credits in international markets.

Carbon Pricing and Carbon Offsets

Although the federal carbon offset system is still being developed, there is no question on the value of existing and future offsets as an important determinant of the price of carbon pollution. In April 2019, the Government of Canada introduced its *Greenhouse Gas Pollution Pricing Act* (GGPPA), legislation that has two main parts: (1) the federal carbon tax levied on 21 types of fuel and combustible waste, and (2) the output-based pricing system (OBPS) that applies to industrial emitters. Taken together, these policies comprise what is sometimes called the 'federal backstop' in subnational Canadian jurisdictions without carbon pricing policies that are equivalent to federal requirements. Canada's GHG offset system is to be established under the provisions of the GGPPA, and is designed to align with the main features of the *Pan-Canadian Greenhouse Gas Offset Framework* devised by the Canadian Council of Ministers of the Environment (CCME).[5]

CANADA'S CARBON PRICING REGIME

The World Bank (2019) documents near 50 countries around the globe that currently impose some sort of price on carbon, either through direct taxes on fossil fuels or through cap-and-trade programs. Canada's federal approach has variations on both; the carbon tax on fossil fuels is payable by fuel distributors, with rates for each fuel that will rise by $10 per year to $50 per tonne of CO_{2eq} by 2022. The OBPS is different than the above-noted cap-and-trade regime in that it subjects facilities to a carbon price on the portion of their emissions that exceeds a set emissions benchmark (rather than a hard cap on total allowable GHG emisssions). Like a cap-and-trade regime, however, the OBPS allows compliant emitters to generate surplus credits that they can bank or sell to other facilities with emissions above the benchmark. Applicable to Canada's highest-emitting industrial sectors, the OBPS puts a price on carbon pollution and requires such facilities to pay a price on carbon for their excess emissions output.

[3] In 2016 Canada introduced its Pan-Canadian Framework on Clean Growth and Climate Change (the 'PCF') to support its Paris commitment to reduce GHG emissions 30 per cent below 2005 levels by 2030. The federal government has recently reported that we should expect a shortfall of 79 million tonnes (MT) of GHGs between our 2030 target and the levels Canada is on track to achieve. See CAN-Rac (2019).

[4] Carbon storage and biomass emissions from forested lands can fluctuate from year to year, so significantly that forests, wetlands and agricultural soils can serve as a sink for carbon in one year and as a source in the next. Over a period of almost 30 years, Canada's forests have swung from being a net sink of 115 million tonnes of carbon in 1992 to a net source of 221 million tonnes of emissions in 2015, with a wide range of results recorded for the interim years (Cameron, 2018). Switching to an accounting methodology for emissions from changing land use and forestry practices would improve the accuracy of Canada's carbon inventory; what is more, it could help to narrow the gap of between our reported CO2 emissions and our Paris target, even if our actual emissions remain the same between now and 2030.

[5] For an overview of the design of the offset system and its implications for regulated emitters, see CCME (2017a; 2017b; 2017c; 2017d).

The relationship between offsets and carbon pricing has two main dimensions. In the first place, a common offset market serves as a way of linking different carbon pricing systems across Canada, harmonized around the price of predictable credits. The ability to buy offsets helps to balance GHG abatement costs in the interim while facilities develop and adopt lower-carbon production technologies. Second, a formalized offset system makes it possible to increase the availability of compliance credits for projects and activities *not* currently covered by carbon pollution pricing (ECCC, 2019). Canada could consider the potential of emission reductions in the agriculture, land use and waste sectors that currently fall outside the requirements of the federal carbon pricing backstop. Voluntary capture of landfill gas, mine methane and ozone depleting substances also provide emission reduction opportunities that could generate carbon offset credits. A floor price can also be built into offset policies in order to send appropriate market signals to disincentivize activities that result in GHG pollution while supporting its abatement in unregulated sectors.

In the domestic context, the private sector, municipalities and other organizations are more likely participate in additional GHG-reduction activities (measure outside of regulatory requirements) when appropriate credit programming is in place. Offsets in these areas should be temporary in nature as governments develop GHG emission requirements across all sectors and activities. Internationally, offsets would open the door for Canadian companies to purchase voluntary carbon credits from abroad in order to meet their domestic compliance obligations. As international carbon trading regimes evolve, Canada will be able to fully integrate voluntary carbon offsets from other jurisdictions while capitalizing on offset credit export opportunities. Such competition could drive innovation and in turn incentivize lower cost and high-quality carbon offset offerings.

RISKS AND UNCERTAINTIES

Critics of carbon offsets are likely to raise important concerns in three different ways. First, it may be argued that international carbon trading moves the substantive benefits of GHG reductions elsewhere, at a time when the priority should be to achieve deeper domestic GHG emission reductions. Reliance on international offsets to meet domestic climate targets may be an indication of weak climate policies. Second, offsets may be argued to not directly result in GHG mitigation and can be depicted as a zero-sum outcome on the climate mitigation balance sheet. Although they are beneficial because they support climate mitigation activities that might not have been possible otherwise, they also allow for GHGs to continue be emitted for the activity for which an offset was purchased. Finally, carbon trading mechanisms like the CDM and Reducing Emissions from Deforestation and Forest Degradation (REDD) have been criticized for displacing indigenous peoples from their traditional territories as well as for harming biodiversity with monoculture plantations.[6]

These concerns highlight the need for the need for robust carbon offset policies and their appropriate use that avoids potential risks. First, in order to minimize climate impacts, every jurisdiction must maximize domestic decarbonization efforts through ambitious climate policies. International offsets should be over and above domestic climate target and not as a means of avoiding more ambitious climate policy. Second, carbon offsets should not be treated as a license to pollute, but rather as a compensation for emissions that have already taken place while every effort is made to avoid such future emissions. In this context, carbon offsets can play an important role to increase GHG mitigation efforts and enable emission reductions that would not have otherwise taken place while supporting other sustainable development objectives (i.e., poverty alleviation, ecosystem and biodiversity health, etc.). Finally, climate mitigation policies must be designed to support the most vulnerable communities and critical ecosystems on the planet. In many cases carbon offsets can have unintended environmental impacts. Consider the examples of afforestation (tree-planting where there were no trees previously) and reforestation (restoring tree coverage lost to harvesting or fire). Carbon offsets through ecosystem restoration activities must align with science, support local biodiversity, and designed with and led by Indigenous people.

[6] Groups active in Canada including the International Indigenous Peoples' Forum on Climate Change ('IIPFCC') have persuasively demonstrated that rather than driving deforestation, indigenous peoples' land management practices are both sustainable and vital to climate mitigation efforts. As a consequence, managed offsets that disrupt the forests and natural ecosystems that many indigenous communities rely on for their livelihoods, may not be purely beneficial.

CONSIDERATIONS FOR AN EFFECTIVE CARBON OFFSET SYSTEM

In our opinion, carbon offsets should be real, additional, transparent and permanent. Recommendations by the Canadian Council of Ministers of the Environment and international best practices broadly align with these principal requirements.

REAL

An offset must accurately represent avoided or sequestered GHG emissions resulting from the actions of a project. The estimation of avoided emissions can be difficult, and therefore it should be conservative and based on sound methodology that avoids overestimations and over-allocations of credits.

ADDITIONAL

Carbon offsets must demonstrate additionality for GHG mitigation activities that are beyond legal requirements while guarding against their use to avoid regulatory compliance. In the first part, steps must be taken to ensure that actors are not paid for emission-reducing activities they would have undertaken anyway. In addition, it is important to recognize that offsets can lower the costs of emitting GHGs (and regulatory compliance) and in turn reduce the incentive for companies to pursue inhouse GHG mitigation activities. Regulatory requirements should ensure that regulated entities that carbon offsets are pursued once inhouse emission reduction measures have been exhausted, and to this end, thresholds could be introduced. This could include permitting the use of carbon offsets beyond descriptive requirements, regulatory compliance price ceilings at which point carbon offsets are enable, and/or limits to the use of carbon offsets to meet regulatory requirements.

TRANSPARENT

Carbon offsets must demonstrate robust monitoring, reporting, and verification requirements. Owing to their history of being issued through accredited independent brokers, effective offsets should always be subject to review and verification by an objective third party. In support of this principle, publicly available credit registries can be maintained, to ensure transparency and to avoid double-counting. Offsets must also be subject to adequate standards of governance including minimum monitoring schedules and enforcement practices. Such standards help to provide consistency across jurisdictions and where applied could improve trust in the common carbon market. The evolving federal offsets framework is capable of providing low-cost emissions reductions across Canada, but the potential for linkage with voluntary markets and international frameworks will require coherent policy direction.

PERMANENT

Ensuring that the emissions improvements made for offset credits cannot be reversed is an important measure of offset programming's effectiveness, and this can be accomplished with suitably robust verification procedures. For example, carbon sequestration removes CO_2 from the atmosphere, but the capacity of carbon storage (i.e., the actual amount of carbon bound up in verified sinks) is both difficult to quantify and could be temporary. In such case, stored CO_2 is eventually released, and therefore, it is important to appropriately take into the duration of carbon storage. Furthermore, at the accounting level, care must be taken to avoid intentional reversals through strict enforcement, as well as policy mechanisms (such as buffer accounts) to provide insurance against unintentional reversals. Issues relating to permanence that may have importance to the development of Canada's federal offset system especially, include the possibilities for insurance of temporary offsets (i.e., such as may be the case with forests or agricultural lands), as well as the inclusion or not of forward crediting (i.e., where offsets expected to be created in future years can be sold in advance).

THE FUTURE OF CARBON OFFSETS

Internationally, carbon offsets can be been implemented through multilateral agreements and all the way down to community-based projects aimed at providing local environmental and economic benefits. Domestically, high-value carbon offset projects can provide deep domestic GHG reductions when supported by appropriate government policies. Caron offsets must be priced competitively to improve bankability, particularly in comparison to alternative mitigation pathways. In theory, the movement towards common carbon markets and the use of predictable offsets against carbon pricing requirements can allow Canada to achieve faster and deeper GHG reductions. In practice, there remains a need to pursue improved carbon offset practices – particularly in the agricultural, forestry and waste sectors – while guarding against risks that can undermine public trust and credibility of carbon offsets.

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