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Canadian Energy Law Foundation Paper

The Evolution of Canada's Carbon Markets and Their Role in Energy Transition

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I. EXECUTIVE SUMMARY

The tapestry of compliance and voluntary market mechanisms for carbon and other environmental attributes in Canada's infrastructure capital markets reflects the almost thirty-year history of carbon policy development in Canada and around the globe. This history of provincial and federal policy and regulatory changes has left some scars and stranded investments. As a result, energy market professionals and emission offset project developers have had to be resilient in their efforts to scale, integrate and maximize opportunities for carbon credit products. Recently, we have witnessed increased efforts towards climate-focused investment criteria and technology-bolstered acceleration towards net-zero targets. Carbon credits are one of the key tools that will allow conventional businesses to continue operating as the economy decarbonizes, and they can also facilitate investment in new technologies and practices that will be critical to achieving material economy-wide emissions reductions. Both domestically and internationally, however, there are key barriers that are limiting carbon markets and that highlight the need for more carbon finance investment and policy certainty, as well as standardization and credibility in both compliance and voluntary environmental product markets.

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Following the Supreme Court of Canada's ruling in March 2021 to uphold the constitutionality of the federal government's *Greenhouse Gas Pollution Pricing Act* ("*GGPPA*"),[2] market expectations were high (and perhaps still are) that the regulatory landscape supporting carbon finance in Canada would finally come into better focus.[3] This paper will explore the current snapshot of compliance and voluntary carbon finance tools available in Canada, and will highlight some of the challenges and opportunities in navigating the interplay between these products.[4]

[2] SC 2018, c 12, s 186 [*GGPPA*]; see also Environment and Climate Change Canada, "Supreme Court of Canada rules on the constitutionality of the Greenhouse Gas Pollution Pricing Act" (last modified 11 May 2021), online: <www.canada.ca/en/environment-climate-change/news/2021/03/supreme-court-of-canada-rules-on-the-constitutionality-of-the-greenhouse-gas-pollution-pricing-act.html>.

[3] See especially Katie Sullivan et al, "Carbon Market Business Brief: Canada Federal Output-Based Pricing System (OBPS)" (last modified May 2021) at 3, online (pdf): *IETA and ClearBlue Markets* <eta.org/resources/Resources/CarbonMarketBusinessBrief/2021/CarbonMarketBusinessBrief_Canada2021.pdfieta.org>.

[4] See Business Council of Canada, Statement, "Carbon pricing is important, but so is stable and predictable regulation" (25 March 2021), online: <thebusinesscouncil.ca/publication/carbon-pricing-is-important-but-so-is-stable-and-predictable-regulation/>; see also Business Council of Canada, "Clean Growth 3.0: Achieving Canadian Prosperity in a Net Zero World" (15 April 2021) at 10, 12-13, 26, 28, online (pdf): <thebusinesscouncil.ca/app/uploads/2021/04/Clean-Growth-3.0.pdf >.

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II. INTRODUCTION

In the almost thirty years since the concept of emissions trading began occupying the consciousness of Canadians some might argue not a lot has changed. Governments, policymakers and stakeholders are still debating and designing regulatory frameworks for emissions trading, focusing on linkages and fungibility, guarding against carbon leakage, preventing double counting and addressing offset credibility concerns. On the other hand, Canadian infrastructure capital markets have evolved dramatically towards decarbonization and net-zero targets in that time, despite the lack of widespread and accessible carbon finance tools in Canadian markets. Among other things, we have seen the development and growth of independent power producers operating both emitting and non-emitting resources across Canada, advancements in energy trading and clean energy technologies, and the more recent emergence of a genuine focus on addressing environmental, social and governance objectives across all sectors of the Canadian economy.

Like the United States, Canada has yet to realize a national, integrated market for carbon emission reduction products, and one with the fungibility and transparency that would facilitate acceleration toward achievement of net-zero goals.[5] Instead, sub-national regulatory frameworks as well as a variety of private-sector voluntary initiatives to introduce carbon trading or financing products have proliferated in North America and beyond. As a result, compliance and voluntary markets for

[5] See generally D Sawyer et al., "2020 Expert Assessment of Carbon Pricing Systems: A report prepared by the Canadian Institute for Climate Choices" (2021) at 9-10, 14-17, 87, online (pdf): <publications.gc.ca/collections/collection_2021/eccc/En4-434-2021-eng.pdf>. See also the discussion of the promise of carbon pricing across Canada provided in "Pan-Canadian Framework: on Clean Growth and Climate Change" (2016), online: <www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html>.

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carbon and other environmental attributes now have decades of experience and are poised to play a critical role in the next era of Canada's transition towards a low-carbon economy.

This paper provides a snapshot of the various compliance and voluntary market mechanisms for carbon emissions and related environmental attribute products available in Canada today, and assesses some challenges and opportunities in this fragmented, and at times overlapping, landscape. First, it provides a background on carbon markets generally, followed by an overview of the Canadian compliance market landscape. Then, it offers an overview of current voluntary carbon markets before canvassing trends in the operation of Canada's carbon markets and assessing the interplay between the compliance and voluntary markets. Finally, it provides key recommendations on how Canadian governments can improve the current compliance markets to allow them to be used more heavily in the coming years as a tool for energy transition.

III. BACKGROUND ON CARBON MARKETS

A. Forms of Carbon Market Mechanisms

In many commercial contracts relating to clean energy infrastructure or emission reduction technologies or projects, the defined term "Environmental Attributes" is a primary focus. It is typically defined broadly to cover inchoate property rights that can be manifest in different types of products—both existing or future—relating to environmental impacts or benefits of the subject undertaking (including such products or instruments as Renewable Energy Credits ("RECs"), Clean Energy Credits ("CECs"), offsets, carbon and other emission allowances, voluntary emission reductions ("VERs"), etc.). Environmental attributes arise from different activity types. "Environmental Attributes" therefore are typically intended to cover both government-issued regulatory instruments such as carbon credits and allowances (referred to as "compliance"

instruments) and products derived from voluntary actions and defined by non-governmental standards bodies (referred to as "voluntary" products), each of which we discuss further below.

The term carbon "credit" is often used ubiquitously in media and elsewhere in the context of products representing greenhouse gas ("GHG") emission reductions, avoidances and removals and their associated regulatory frameworks. However, despite the frequent use of blanket or interchangeable terminology, the relevant carbon markets, associated regulations and voluntary standards warrant a more nuanced nomenclature and understanding of the underlying nature of the form of environmental attribute at issue.

The two primary models of emissions market mechanisms (whether compliance or voluntary) used in Canada today are: (i) cap-and-trade mechanisms; and (ii) output-based pricing systems. In the cap-and-trade model (as in Quebec and Nova Scotia), regulated emitting facilities are allocated (or in some cases must purchase at publicly administered auctions) an "allowance" of a certain quantity of emissions (typically on an annual basis) and where the underlying commodity is an emission "allowance" representing the right to emit one metric tonne ("Mt") of the covered substance. Output-based pricing systems do not set a fixed cap on the volume of emissions, but rather limit emissions per unit of economic output. Output-based pricing systems operate on a baseline-and-credit structure, where regulated emitting facilities are required to reduce emissions to a prescribed baseline, emission reductions below the baseline are available to facilities with an obligation or voluntary target for use as an emission "credit" or "offset" by, and where this "credit" or "offset" also represents the notional reduction of one Mt of covered emissions.

As between the two types of markets, cap-and-trade mechanisms are inherently designed to be more liquid as the tradeable commodity is issued and available to market participants to physically trade at first instance and during the applicable compliance period. Ultimately, however, the liquidity and utility of any emissions market or underlying emission product is dependent on the number and diversity of market participants and, most critically, on the stability and existence of the underlying commodity itself. While Canada has no shortage of energy trading professionals, trading platform operators and project developers, the short-lived history of the Montreal Climate Exchange's "MCX" Canadian Carbon Futures Contract (based on a then-conceptual Canadian federal greenhouse gas "allowance"), launched in 2008 and discontinued shortly thereafter in the same year, is a stark reminder that an underlying commodity needs to exist before it can be meaningfully traded.[6] As stakeholders consider the patchwork of compliance and voluntary structures for transacting in carbon products today, the stability and credibility of the underlying commodity itself remains of utmost importance.

IV. COMPLIANCE MARKETS FOR CARBON CREDITS IN CANADA

A. Regulating Greenhouse Gas Emissions in Canada

Canada has two layers of frameworks for regulating GHG emissions (we interchangeably refer to "GHG emissions" as "carbon emissions") – federal and provincial. While some provinces and commentators recently challenged the federal government's jurisdiction under the *Constitution Act, 1867* ("*Constitution*") to regulate GHG emissions through minimum carbon pricing standards in the *Greenhouse Gas Pollution Pricing Act* ("*GGPPA*"), a majority of the Supreme Court of

[6] "The Montréal Climate Exchange Is Established: A partnership between the Montréal Exchange and the Chicago Climate Exchange" (12 July 2006), online (pdf): *Chicago Climate Exchange & Montréal Exchange* <www.m-x.ca/f_comm_press_en/011-06_en.pdf>.

Canada ("SCC") concluded in *References re Greenhouse Gas Pollution Pricing Act* that the *GGPPA* is constitutional and that federal Parliament had the jurisdiction to enact it as a matter of national concern under the *Constitution*'s peace, order and good government clause.[7]

B. Federal Framework for a Compliance Market

1. Overview of the GGPPA

The *GGPPA* has two key parts: Part 1 imposes a fuel charge on fuel producers and distributers ("fuel charge")[8] and Part 2 introduces an output-based pricing system ("OBPS") for certain large industrial emitters. These elements apply in provinces and territories that fail to meet the *GGPPA*'s pricing and emissions reduction benchmarks, either because the province or territory fails to enact GHG pricing laws at all, or their regime falls below the federal benchmarks for GHG pricing stringency. Provinces and territories are free to choose whether to implement a carbon price or a cap-and-trade system, so long as they meet the minimum federal pricing and emissions reduction targets. As of April 1, 2020, the federal backstops covered an estimated 31% of Canada's GHG emissions, and provincial and territorial systems combined to cover an additional estimated 47% of Canada's emissions.[9]

2. Federal OBPS and Compliance Market

The federal OBPS applies to facilities that (i) are located in a jurisdiction that does not meet the federal minimum GHG pricing stringency, (ii) emit 50,000 Mt or more of carbon dioxide

[7] See e.g., *References re Greenhouse Gas Pollution Pricing Act*, 2021 SCC 11, 455 DLR (4th) 1 at paras 80-82, 200, 206.

[8] Discussion of the fuel charge in the *GGPPA* is beyond the scope of this paper.

[9] Environment and Climate Change Canada, "Pan-Canadian Approach to Pricing Carbon Pollution: Interim Report 2020" (2021) at 3, online (pdf): <publications.gc.ca/collections/collection_2021/eccc/En4-423-1-2021-eng.pdf >.

equivalent ("CO_2e", and metric tonnes of carbon dioxide equivalent, "$MtCO_2e$") annually, and (iii) engage in specific industrial activities.[10] Facilities emitting less than 50,000 $MtCO_2e$ can request to be covered by the OBPS.[11] The federal OBPS currently applies in Manitoba, Prince Edward Island, Yukon, Nunavut and partially (as discussed further below) in Saskatchewan.[12]

Under the federal OBPS, covered facilities have annual emissions limits based on the facility's production from specific industrial activities and the output-based standard applicable to those activities, determined in accordance with sections 36 to 43 of the *Output-Based Pricing System Regulations* ("*OBPS Regulations*"). Covered facilities must report on their annual emissions and production and compensate for any emissions above their emissions limits.[13] A covered facility with emissions below its emissions limit receives surplus credits equal to the difference between the applicable emissions limit and the facility's actual emissions, with each surplus credit representing one Mt of CO_2e.[14]

[10] *GGPPA*, *supra* note 2, ss 169, 174; see generally *Output-Based Pricing System Regulations*, SOR/2019-266, s 8 [*OBPS Regulations*] (the specific industrial activities captured by the OBPS to include: (i) oil and gas production; (ii) mineral processing; (iii) chemical production; (iv) pharmaceutical production; (v) iron, steel and metal production; (vi) mining and ore processing; (vii) fertilizer production; (viii) food processing; (ix) pulp and paper processing; (x) automotive assembly; and (xi) electricity generation: *OBPS Regulations*, Schedule 1).

[11] *GGPPA*, *ibid*, s 172; see generally Government of Canada, "Voluntary participation policy for Output-Based Pricing System" (last modified 28 June 2019), online: <www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/voluntary-participation-policy.html>. A facility's motive to voluntarily participate in the federal OBPS or a provincial OBPS may be to gain the ability to generate and sell credits, market its choice to participate and reduce its emissions even when not required to do so, or simply to transition early into participation and resolve the challenges of doing so while participation remains voluntary, in anticipation of participation becoming mandatory in the future.

[12] *GGPPA*, *ibid*, Schedule 1, Part 2.

[13] *Ibid*, ss 173, 174(1).

[14] *Ibid*, s 175; see also *OBPS Regulations*, *supra* note 10, s 59.

If a facility exceeds its annual emissions limit, it must provide compensation for its excess emissions through one or a combination of the following methods: (i) making an excess emissions surcharge payment electronically to the Receiver General for Canada, or (ii) remitting "compliance units" which may include surplus credits a facility earned in a previous year, surplus credits purchased from another facility, federal offset credits or recognized provincial or territorial offset credits.[15]

The federal government initially set the excess emissions surcharge at $10 per $MtCO_2e$ in 2018, increasing it by $10 per Mt per year to reach $50 per $MtCO_2e$ in 2022.[16] It subsequently announced that the surcharge will increase by $15 per year after 2022 to reach $170 per $MtCO_2e$ in 2030 (although these increases are not yet set out in the *GGPPA* or regulations).[17] The market price for compliance units, whether surplus credits or offset credits, is expected to increase with the emissions surcharge value, with commercial transactions in these products occurring at some discount from the compliance surcharge to justify the use of those tools rather than compliance users paying the surcharge.

[15] *GGPPA*, *supra* note 2, s 174(2); see also Environment and Climate Change Canada, "Overview: Output-based Pricing System Regulations Under The Greenhouse Gas Pollution Pricing Act" (2019) at 4-5, online (pdf): <www.canada.ca/content/dam/eccc/documents/pdf/obps/Document-A-EN.pdf>

[16] *GGPPA*, *supra* note 2, Schedule 4.

[17] Government of Canada, "Update to the Pan-Canadian Approach to Carbon Pollution Pricing 2023-2030" (last modified 5 August 2021), online: <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> [2023-2030 Update to the Pan-Canadian Approach].

Subject to earlier suspension, revocation, or cancellation, surplus credits remain viable for remittance for five calendar years from their issuance, and offset credits remain viable for remittance for eight calendar years after they are created.[18]

3. Offset Credit Recognition

The *OBPS Regulations* currently recognize an offset credit as a compliance unit for the federal OBPS regime if it is issued by a province or territory under an offset protocol[19] and program[20] that is set out in a list published by Environment and Climate Change Canada ("ECCC").[21] As of January 1, 2022, the only two provincial offset programs listed by ECCC are those of Alberta and British Columbia. The only offset protocols it recognizes are those in Alberta for aerobic composting, aerobic landfill bioreactor projects, pneumatic devices and cattle-related activities.[22]

The federal government is also currently developing a system for federal offset credits made up of three main components: (1) regulations under the *GGPPA* to establish the framework for offset credit generation and to authorize the issuance of credits and the creation of offset protocols, (2) offset protocols to establish the methods for quantifying GHG reductions for different activities and (3) a credit and tracking system to register offset projects and issue and track offset credits.[23]

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[18] *OBPS Regulations*, *supra* note 10, ss 70-71.

[19] An offset protocol is a methodology for quantifying GHG reductions generated by given activities.

[20] An offset program is a system allowing for the generation and tracking of credits.

[21] *OBPS Regulations*, *supra* note 10, ss 78(1)-(3).

[22] See Environment and Climate Change Canada, "List of Recognized Offset Programs and Protocols for the Federal OBPS" (last modified 7 March 2022), online: <www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/list-recognized-offset-programs-protocols.html>.

[23] See Government of Canada, "Federal Greenhouse Gas Offset System" (last modified 18 January 2022), online: <www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-

In March 2021, the federal government published draft *Greenhouse Gas Offset Credit System Regulations* which, when finalized, will form the first of these three components.[24] ECCC has also commenced development of federal offset protocols for improved forest management, enhanced soil organic carbon and livestock feed management, and has published draft federal offset protocols for landfill methane recovery and reducing GHG emissions from refrigeration systems.[25]

C. Provincial Frameworks for Compliance Markets

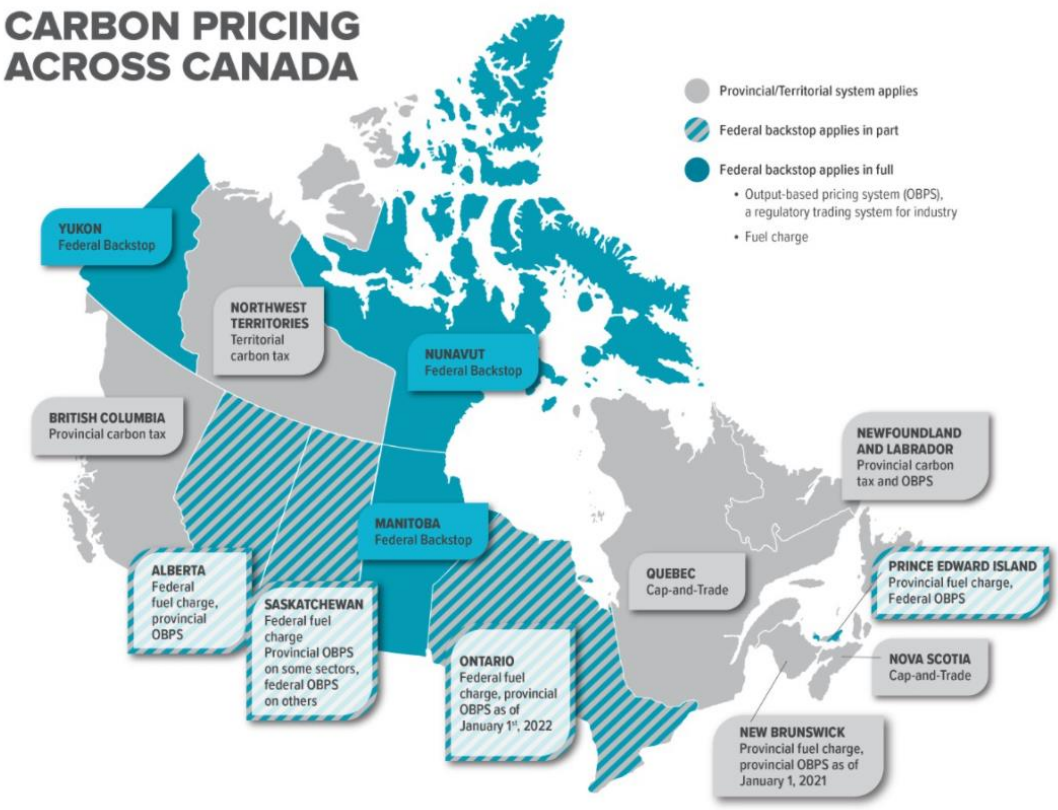
Provinces take various approaches to pricing carbon, by either becoming subject to one or both parts of the federal *GGPPA*, developing their own carbon pricing systems, or accepting a hybrid federal-provincial regime. The figure below provides an overview of the systems in place across Canada.[26]

work/output-based-pricing-system/federal-greenhouse-gas-offset-system.html> [Federal Greenhouse Gas Offset System].

[24] *Greenhouse Gas Offset Credit System Regulations (Canada),* (2021) C Gaz I, Vol. 155, No 10.

[25] Federal Greenhouse Gas Offset System, *supra* note 23.

[26] See Government of Canada's webpage: "Carbon pollution pricing systems across Canada" (last modified 22 March 2022), online: <www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work.html>.



For brevity in this paper, we summarize selected GHG OBPS frameworks in provinces that have developed their own emissions pricing regimes for certain industries and sectors and their associated carbon compliance markets.

D. British Columbia

British Columbia ("B.C.") uses its own economy-wide carbon tax as its primary mechanism to price GHG emissions within the province. However, B.C. also introduced an emission limit system for certain sectors with compliance options that include purchasing emission offsets or credits.

1. Emission Limits and Compliance Market

B.C.'s *Greenhouse Gas Industrial Reporting and Control Act* ("*GGIRCA*") establishes GHG emission limits for certain industrial facilities or sectors.[27] At present, the *GGIRCA* only regulates liquefied natural gas facilities operations.[28] Covered facilities must report their GHG emissions and reduce emissions to their applicable benchmarks, or, if they cannot meet their benchmark, submit compliance units for excess emissions by: (i) earning or purchasing emissions offsets from approved emission offset projects, (ii) applying earned credits from prior years or from third-party regulated facility operators, or (iii) purchasing government-generated credits ("funded units").[29]

Under the *GGIRCA*, covered facilities may use B.C. offset unit equivalents from another jurisdiction to comply with *GGIRCA*'s emission benchmarks.[30] However, at present, no regulations provide for unit equivalency from other jurisdictions.

The *Greenhouse Gas Emission Control Regulation ("GGECR"),*[31] adopted under the *GGIRCA*, establishes the B.C. Carbon Registry to monitor compliance unit transactions and enable compliance unit issuance, transfer and retirement. This regulation provides mechanics for regulated operators to comply with the prescribed emissions benchmarks by purchasing emission

[27] SBC 2014, c 29, ss 5, 6(1) [*GGIRCA*].

[28] *Ibid*, s 1(1) ("regulated operation" and Schedule of Regulated Operations and Emission Limits).

[29] *Ibid*, ss 6(2), 8-12.

[30] *Ibid*, ss 1(1), 14(2) ("compliance unit" and "recognized unit").

[31] BC Reg 250/2015 [*GGECR*].

offsets from the market or funded units from the B.C. government. Funded units currently cost $25 per $MtCO_2e$.[32]

Emission offsets may be generated in B.C. by removing or reducing GHG emissions via approved emission offset projects, developed in accordance with an approved emission offset protocol.[33] As of April 1, 2022, reducing emissions through energy conservation, energy efficiency, and switching to lower carbon fuels is the only approved emission offset protocol.[34] Additional protocols are being developed for forest carbon offsets and offsets from methane management in relation to landfill gas, organic waste diversion, and anaerobic digestion.[35]

In addition to the compliance market created by the *GGIRCA*, public sector organizations, including the B.C. government, must be carbon neutral each year under the *Climate Change Accountability Act ("CCAA")*.[36] If they fail to achieve carbon neutrality by reducing their attributed GHG emissions under the *Carbon Neutral Government Regulation*,[37] the organization must acquire emission offset units under the *GGIRCA*.[38]

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[32] *Ibid*, s 28.

[33] *GGIRCA*, *supra* note 27, ss 8-10; *GGECR*, *supra* note 31, ss 11-27.

[34] See BC Ministry of Environment and Climate Change Strategy, "British Columbia Greenhouse Gas Offset Protocol: Fuel Switch" (21 August 2019), online (pdf): <www2.gov.bc.ca/assets/gov/environment/climate-change/ind/protocol/bc_fuel_switch_protocol_2019.pdf>.

[35] See Government of British Columbia, "Developing emission offset projects" (last visited 3 April 2022), online: <www2.gov.bc.ca/gov/content/environment/climate-change/industry/offset-projects/develop>.

[36] SBC 2007, c 42, s 5(1) [*CCAA*].

[37] C Reg 392/2008.

[38] *CCAA*, *supra* note 36, s 6; *GGIRCA*, *supra* note 27, s 1(1) ("offset unit").

E. Alberta

1. Provincial OBPS and Compliance Market

Alberta's OBPS for industrial facilities is implemented by the *Technology Innovation and Emissions Reduction Regulation* ("*TIER*"),[39] under Alberta's *Emissions Management and Climate Resilience Act*.[40] The *TIER* represents the latest in several revisions to Alberta's GHG pricing regime for industrial emissions and was first instituted under the *Specified Gas Emitters Regulation* in 2007. It applies to approximately 60% of Alberta's emissions.[41]

The *TIER* applies to Alberta facilities emitting 100,000 Mt or more of GHG emissions annually.[42] A facility emitting less than 100,000 Mt of GHG may voluntarily apply to be subject to the *TIER*.[43] *TIER*-regulated facilities have allowable emissions limits determined based on emissions intensity benchmarks specific to their facility or industry.[44]

TIER-regulated facilities have four means of complying with *TIER* emissions limits: (i) reduce their emissions via increasing year-over-year operating efficiencies, (ii) contributing the requisite fee to the *TIER* Fund to obtain a "fund credit" for each Mt of excess emissions,[45] (iii) using emission performance credits ("EPCs") generated by another *TIER*-regulated facility,[46] or (iv)

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[39] Alta Reg 133/2019 [*TIER*].

[40] SA 2003, c E-7.8.

[41] Government of Alberta, "Technology Innovation and Emissions Reduction Regulation" (last visited 3 April 2022), online: <alberta.ca/technology-innovation-and-emissions-reduction-regulation.aspx>.

[42] *TIER, supra* note 39, ss 1(1)(cc), 9, 12.

[43] *Ibid,* ss 4-5.

[44] *Ibid,* ss 9-12.

[45] *Ibid,* s 21.

[46] *Ibid,* s 20.

using emission offsets generated by facilities that voluntarily reduce or sequester GHG emissions, in accordance with an approved emission offset protocol.[47]

The cost to obtain *TIER* fund credits is set each year by Ministerial Order. That cost increased in-step with the excess emissions surcharge under the federal OBPS to $50 per Mt in 2022.[48] As of the date of this paper, there is no prescribed increased cost for *TIER* fund credits beyond 2022.

2. Emission Performance Credits and Emission Offsets

TIER-regulated facilities that reduce their emissions to below their emissions limits in the current or previous compliance year receive EPCs.[49] EPCs issued for 2017 or a subsequent year may only be used to satisfy *TIER* requirements for eight years before the credit expires.[50]

Non-*TIER* regulated facilities can generate emission offsets by voluntarily undertaking a project or activity in Alberta that reduces or sequesters GHG emissions. To generate *TIER*-recognized and transferrable emission offsets, projects must satisfy the applicable requirements set out in *TIER* sections 18 and 19, the *Standard for Greenhouse Gas Emission Offset Project Developers* ("Emission Offset Standard")[51] and an approved offset quantification protocol. Emission offsets are serialized and publicly listed on the Alberta Emission Offset Registry.[52]

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[47] *Ibid*, s 19.

[48] *Ibid*, s 21(2); Ministerial Order 87/2021: *Technology Innovation and Emissions Reduction Fund Credit Amount Order*.

[49] *TIER*, *supra* note 39, s 20.

[50] *Ibid*, s 13(6).

[51] Alberta Environment and Parks, "Standard for Greenhouse Gas Emission Offset Project Developers" (November 2019), online: <open.alberta.ca/publications/standard-for-greenhouse-gas-emission-offset-project-developers-version-3> [Emission Offset Standard].

[52] CSA Group, "Alberta Emissions Offset Registry" (last visited 3 April 2022), online: <alberta.csaregistries.ca/>.

As of April 1, 2022, Alberta has 18 approved quantification protocols for emission offsets. The quantification protocols cover a wide range of activities, including: aerobic composting, landfill bioreactor projects, agricultural nitrous oxide emission reductions, biofuel, biogas, energy generation from biomass waste, carbon capture and storage, distributed renewable energy generation, solar and wind electricity generation, energy efficiency projects, enhanced oil recovery, pneumatic devices, landfill gas capture, reducing GHG emissions from fed cattle and genetic selection, vent gas reduction and waste heat recovery.[53]

Like EPCs, emission offsets issued in recognition of a GHG emissions reduction, sequestration or capture have a limited shelf life. An emission offset issued for activities that took place in 2017 or a subsequent year may only be used to satisfy *TIER* requirements for nine years after the activity occurred.[54]

Under the *TIER*, activities must be able to demonstrate "additionality", meaning they must go beyond "business-as-usual", to generate valid emission offsets.[55] Alberta's *Technical Guidance for the Assessment of Additionality* establish the process and criteria to assess activities for additionality in response to new legislation or directives, when a new emission offset quantification protocol is being developed and periodically as part of the regular protocol review cycle.[56] The Government of Alberta may withdraw a protocol when an activity covered by an

[53] Government of Alberta, "Alberta Emission Offset System" (last visited 3 April 2022), online: <alberta.ca/alberta-emission-offset-system.aspx>.

[54] *TIER*, *supra* note 39, s 13(6).

[55] Government of Alberta, "Technical Guidance for the Assessment of Additionality" (May 31, 2018), online: <open.alberta.ca/publications/technical-guidance-for-the-assessment-of-additionality> [Additionality Guideline].

[56] *Ibid*, ss 2-5.

emission offset quantification protocol is determined to no longer be additional in terms of its GHG emissions reductions, removal or capture.[57] For instance, the *Quantification Protocol for Conservation Cropping* was withdrawn following an additionality assessment that determined that 60 to 75% of applicable farmland was implementing the no-tillage techniques without reliance on the protocol.[58] Once withdrawn, new offset projects for the generation of emission offsets for the activity covered by that protocol will not be approved.

F. Saskatchewan

Saskatchewan has its own OBPS for large industrial emitters that partially satisfies federal minimum standards, so the federal OBPS applies only in part.

1. Application of Provincial and Federal OBPS

The *Management and Reduction of Greenhouse Gases Act* ("*MRGGA*"),[59] creates the overarching framework for Saskatchewan's OBPS by requiring regulated emitters to establish baseline emission levels for their facilities and to reduce their GHG emissions by prescribed amounts below those levels each year.[60] The OBPS is implemented through *The Management and Reduction of*

[57] Emission Offset Standard, *supra* note 51, Part 1, s 6 and Part 2, ss 1.8-1.9; see also Additionality Guideline, *supra* note 55, s 2.

[58] Alberta Environment and Parks, *Additionality Assessment of the Quantification Protocol for Conservation Cropping* (2019), online (pdf): <www.alberta.ca/assets/documents/aep-memo-to-stakeholders-conservation-cropping-additionality.pdf>; Alberta Environment and Parks, *Memorandum: Withdrawal of the Quantification Protocol for Conservation Cropping, Version 1.0* (2020), online (pdf): <alberta.ca/assets/documents/aeos-memo-withdrawal-quantification-protocol-conservation-cropping.pdf> [*Withdrawal of the Conservation Cropping Protocol*].

[59] SS 2010, c M-2.01 [*MRGGA*].

[60] *Ibid*, ss 17-18.

Greenhouse Gases (Standards and Compliance) Regulations[61] ("*MRGG Regulations*"), which establish the facilities subject to emission reduction requirements, prescribe applicable emission limits or "permitted emissions" and set out compliance mechanisms.

Pursuant to the *MRGG Regulations*, the provincial OBPS applies to industrial facilities emitting greater than 25,000 $MtCO_2e$ per year in sectors including mining, manufacturing, pulp, steel, fertilizer, refining, oil and gas, forestry and waste.[62] Facilities emitting between 10,000 and 25,000 $MtCO_2e$ per year can also request to become regulated emitters under the *MRGG Regulations*.[63] A Ministerial direction published in the Saskatchewan Gazette in December 2021 purports to lower this threshold for voluntary participation to 0 $MtCO_2e$ per year, effective January 1, 2022;[64] however, this change is not reflected in published versions of the *MRGG Regulations* and Ministerial authority to amend regulations (as opposed to standards) under the *MRGGA* is unclear.

Regulated facilities under Saskatchewan's OBPS incur a compliance obligation if their total regulated emissions exceed their permitted annual emissions.[65] A compliance obligation may be fulfilled by paying the requisite per Mt fee for excess emissions into a Technology Fund or by undertaking any other approved compliance option related to reducing, sequestering or limiting GHG emissions.[66] Other compliance options include using emission offsets or performance

[61] RRS c M-2.01 Reg 3 [*MRGG Regulations*].

[62] *Ibid*, ss 3(1),(7), 5, Appendix, Table 1.

[63] *Ibid*, ss 3(3), 6 (1) (Annual permitted emissions for regulated facilities are a function of production and applicable performance standards for emissions intensity set out in the Table 1).

[64] Amendment – The Management and Reduction of Greenhouse Gases (Standards and Compliance), (2021) S Gaz I, Vol 117, No 51, 3904.

[65] *Ibid*, s 17(1).

[66] *Ibid*, s 18 (2).

credits, as approved by the Saskatchewan Ministry of Environment.[67] The per Mt fee for excess emissions payable to the Technology Fund is set at $50 per Mt for 2022.[68]

Because Saskatchewan's OBPS only partially meets federal minimum standards, the federal GHG pricing system applies to emission sources not covered by the *MRGGA*. Emission sources covered by the federal OBPS regime include electricity generation and natural gas transmission pipelines.[69]

2. Performance Credits and Offsets

Saskatchewan has adopted the *Management and Reduction of Greenhouse Gases (Performance Credit) Standard* ("Performance Credit Standard") under the *MRGG Regulations* to provide standards for earning, using, purchasing, selling and retiring performance credits.[70] Under the Performance Credit Standard, a regulated facility can earn a performance credit if its total annual emissions are below its emissions limit.[71] Performance credits must be serialized and registered in Saskatchewan's credit registry to be valid for a regulated emitter to "retire" a performance credit

[67] *MRGGA*, *supra* note 59, s 20; *MRGG Regulations*, *supra* note 61, ss 18 (2), 20.

[68] *Establish Rate for Payment for the Provincial Technology Fund for Regulated Emitters Subject to the Management and Reduction of Greenhouse Gases (Standards and Compliance) Regulations*, OC 616/2021 (2021) *($50/tonne CO2e in 2022)*.

[69] *GGPPA*, *supra* note 2, ss 169, 174, Schedule 1, Part 2; *OBPS Regulations*, *supra* note 10, ss 8, Schedule 1, Table 1, items 5, 38.

[70] *MRGG Regulations*, *supra* note 61, s 4(1); Government of Saskatchewan, "The Management and Reduction of Greenhouse Gases (Performance Credit) Standard" (August 2021), online (pdf): <publications.saskatchewan.ca/#/products/114646>.

[71] *MRGG Regulations*, *ibid*, ss 2-3.

as a means of fulfilling a compliance obligation.[72] Performance credits in Saskatchewan have no expiration date.[73]

While emission offset credits are recognized as a potential compliance option and the *MRGGA* defines them as credits for any prescribed activity that reduces, sequesters, or captures and prevents the release of GHG emissions,[74] Saskatchewan currently has no emission offset regime. However, the province is in the process of developing an emission offset program to recognize offset credits for reductions in GHG emissions *MRGGA* does not already regulate.[75] Once finalized, the program would allow for the issuance of emission offset credits to project developers who sequester or reduce GHG emissions via an approved quantification protocol.[76] Saskatchewan has prioritized the development of two quantification protocols to implement this program, one covering landfill gas capture and combustion and the other addressing aerobic composting activities.[77]

[72] *Ibid*, ss 4(3)-4).

[73] *Ibid*, s 4 (8).

[74] *MRGGA*, *supra* note 59, s 2.

[75] Government of Saskatchewan, "Saskatchewan Greenhouse Gas Offset Program Proposal Paper" (February 2021), online (pdf): <pub-saskatoon.escribemeetings.com/filestream.ashx?DocumentId=142161>.

[76] *Ibid* at 3, 7.

[77] *Ibid* at 16.

G. Ontario

On January 1, 2022, Ontario officially transitioned from the federal OBPS to its own OBPS for large industrial emitters.[78] The federal OBPS previously applied in Ontario since it came into effect on January 1, 2019, after Ontario cancelled its GHG cap-and-trade program in July 2018.[79]

1. Provincial OBPS and Compliance Instruments

Ontario has introduced an emissions performance standard ("EPS") program to address GHG emissions from large industrial facilities in the province that would otherwise have been captured by the federal OBPS. The EPS program is implemented through the *Greenhouse Gas Emission Performance Standards*[80] (the "EPS Standards"), which came into full effect on January 1, 2022.

The EPS Standards apply to industrial facilities with annual emissions of at least 50,000 $MtCO_2e$ in regulated sectors.[81] Smaller facilities with annual emissions between 10,000 and 50,000 $MtCO_2e$ can apply to voluntarily opt-in to the EPS Standards.[82]

The EPS Standards require facilities they regulate to reduce emissions below an annual output-based emissions limit, or, if they exceed their limit, satisfy a compliance obligation for excess

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[78] *Order Amending Part 2 of Schedule 1 to the Greenhouse Gas Pollution Pricing Act*, SOR/2021-195, (2021) C Gaz II, Vol 155, No 18.

[79] Bill 4: *An Act respecting the preparation of a climate change plan, providing for the wind down of the cap and trade program and repealing the Climate Change Mitigation and Low-carbon Economy Act, 2016*, 1st Sess, 42nd Leg, Ontario, 2018 (assented to 31 October 2018); *Prohibition against the Purchase, Sale and Other Dealings with Emission Allowances and Credits*, O Reg 386/18.

[80] O Reg 241/19 [*EPS Standards*].

[81] *Ibid*, s 2(2).

[82] *Ibid*, s 4(2) (regulated sectors are identified in the EPS Standards, Schedule 2, as including cement, chemicals, electricity generation, food (specifically sugar and corn milling), industrial, food and fuel ethanol, metal tubes and steel, lime, metal mining or milling, mineral products, natural gas liquids, natural gas transmission, non-ferrous metal smelting and refining, petroleum refineries, oilseeds processing, pulp and paper, upstream oil extraction and upgrading and vehicle manufacturing).

emissions.[83] The total annual emissions limit for a facility or sector is determined in accordance with the *GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit*.[84] Factors that may affect the total annual emissions limit for a facility include the applicable emissions intensity or performance standard and the historical emissions of a covered facility or sector.[85]

A facility's compliance obligation under the EPS Standards is the difference between its total emissions and its annual emissions limit.[86] A covered facility can satisfy its compliance obligation by submitting compliance instruments, which currently include excess emissions units and emissions performance units.[87] Excess emissions units are non-tradable and must be purchased from the Government of Ontario at a price of $50 per $MtCO_2e$ for 2022.[88] The cost of excess emission units for compliance periods beyond 2022 has not yet been prescribed by regulation.

Emissions performance units are issued to a facility to recognize the amount by which the facility's total annual emissions were reduced below its annual limit, in $MtCO_2e$.[89] Unlike excess emissions

[83] *EPS Standards*, *supra* note 80, s 13.

[84] Government of Ontario, "GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit" (October 2021), online (pdf): <prod-environmental-registry.s3.amazonaws.com/2021-10/GHG%20EPS%20and%20Methodology%20for%20the%20Determination%20of%20the%20TAEL%20October%202021%20(EN)_0.pdf> [Limits Methodology].

[85] *Ibid* at 5-28.

[86] *EPS Standards*, *supra* note 80, s. 13(2).

[87] *Ibid*, s 1(1).

[88] *Ibid*, ss 9, 11(9).

[89] *Ibid*, s 16(1).

units, emissions performance units can be banked or traded with other covered facilities in the program.[90] However, emissions performance units expire after five years.[91]

The Ontario OBPS currently does not provide for emissions offsets as a compliance option.

H. Newfoundland and Labrador

Newfoundland and Labrador implements its own OBPS under the *Management of Greenhouse Gas Act* ("*MGGA*")[92] and *Management of Greenhouse Gas Regulations ("MGGR")*.[93]

The *MGGA* makes onshore and offshore large industrial facilities and large-scale electricity generation subject to annual emission targets.[94] Facilities emitting more than 25,000 $MtCO_2e$ are required to reduce their emissions by 10% in 2021, and by 12% in 2022.[95] Facilities emitting between 15,000 and 25,000 $MtCO_2e$ annually may apply to opt-in to the *MGGA*.[96]

The *MGGA* and *MGGR* provide for the use of greenhouse gas reduction credits as an alternative compliance mechanism for a facility to achieve its reduction targets.[97] These credits can take one of three forms, including: (i) Greenhouse Gas Reduction Fund credits, priced at $50 per $MtCO_2e$

[90] *Ibid*, ss 11(5), 19.

[91] *Ibid*, s 11(5).

[92] SNL 2016, c M-1.001 [*MGGA*].

[93] NLR 116/18 [*MGGR*].

[94] *MGGA*, *supra* note 92, ss 2(h), 5; *MGGR*, *supra* note 93, s 8.

[95] *MGGR*, *ibid*, ss 3, 8(1).

[96] *MGGA*, *supra* note 92, s 5.1.

[97] *Ibid*, s 2(e),(g),(l),(n); *MGGR*, *supra* note 93, s 9.

for 2022, (ii) performance credits awarded to a regulated facility for over-achieving its emission reduction targets, and which are bankable and tradeable across facilities and (iii) offset credits earned by a facility for an activity that reduces or sequesters GHG emissions in accordance with regulations developed under the *MGGA*.[98] However, as of March 1, 2022, no regulations have been developed to allow for the generation of offset credits in Newfoundland and Labrador.

V. VOLUNTARY CARBON MARKETS

While emission offsets usable for regulatory compliance in Canada are a statutory construct, there is also a growing trade in carbon credits or otherwise identified environmental attributes generated under voluntary, geographically unconstrained carbon standards, known as voluntary carbon markets. The voluntary markets represent a non-regulatory means of directing financial resources to projects delivering independently verified emissions reductions or other environmental benefits on a global scale. Such reductions are complementary and in addition to any carbon emissions regulated in compliance markets.

A. Impetus Toward Voluntary Carbon Markets

Beyond compliance markets, there is an increasing number of carbon-emitting enterprises seeking to procure environmental attributes for purposes such as: (i) wholly or partially meeting internal carbon reduction commitments, (ii) achieving other environmental, social and governance ("ESG") targets, (iii) meeting contractual requirements with their customers, (iv) responding to investor and public climate change and air quality concerns and (iv) offsetting their emitting

[98] *MGGA*, *supra* note 92, s 2(e),(g),(l),(n); *MGGR*, *supra* note 93, ss 10-12; see also Government of Newfoundland and Labrador, "Provincial Government Releases Federally-Approved Made-in-Newfoundland and Labrador Approach to Carbon Pricing" (October 23, 2018), online: <gov.nl.ca/releases/2018/mae/1023n01/>.

operations to meet covenants stipulated in green bonds or other sustainability-linked debt instruments. This demand for voluntary carbon credits increases the potential market available to suppliers of carbon credits and can provide financial incentive for projects and other emissions-reducing activities that are not eligible to participate in a particular compliance market. As in the compliance markets, carbon credits generated in voluntary markets are non-financial commodities that can be bought and sold independently of other products.

Given the global trend towards ESG-oriented investing, there is potential for the demand for, and volume and pricing of, voluntary carbon credits to eventually outstrip the supply and legislated price in the compliance markets. In Canada, the demand for voluntary carbon credits will be spurred by carbon neutrality targets set by large organizations, including members of the Net-Zero Banking Alliance (which includes all of Canada's "Big Five" banks),[99] the Oil Sands Pathways to Net Zero initiative (which includes Canadian Natural Resources, Cenovus Energy, ConocoPhillips, Imperial, MEG Energy and Suncor Energy),[100] numerous large public organizations (including Air Canada, Stantec and TELUS),[101] and educational institutions

[99] BMO Financial Group, "Six of Canada's Largest Banks Join United Nations-convened Net-Zero Banking Alliance", *Canada Newswire* (15 October 2021), online: <newswire.ca/news-releases/six-of-canada-s-largest-banks-join-united-nations-convened-net-zero-banking-alliance-801190199.html>.

[100] "An alliance for Canada" (last visited 23 March 2022), online: Oil Sands Pathways to Net Zero: <oilsandspathways.ca/#alliance>.

[101] "Environment: What we're doing…" (last visited 3 April 2022), online: *Air Canada* <www.aircanada.com/ca/en/aco/home/about/corporate-responsibility/environment.html#/>; Brendan Player & Jeff Tabar, "Capturing carbon: How nature-based solutions help achieve net zero goals" (4 October 2021), online: *Stantec* <stantec.com/en/ideas/topic/climate-change/capturing-carbon-why-nature-based-solutions-are-the-tool-of-choice-to-achieve-net-zero-goals>; "Radicle announces investment by TELUS Ventures to accelerate growth: Canada's largest developer of compliance-grade carbon credits targets global expansion" (last visited 3 April 2022), online: *Telus Ventures* <telus.com/en/ventures/news/radicle>.

(including Concordia University, Université de Montreal and the University of Toronto)[102]. The number of participants in voluntary carbon markets is expected to grow as more organizations and industry sectors adopt carbon emissions or net zero targets and seek financial products to hedge against the financial risks posed by the clean energy transition and climate change.

The price of voluntary carbon credits varies significantly based on the nature and location of the offset or emissions-reduction project, and whether it is sold on a spot or forward basis. For example, current pricing for voluntary carbon credits varies from a few cents to upwards of US$15 per $MtCO_2e$ for afforestation and reforestation projects.[103] Conversely, technology-based carbon removal projects such as carbon capture and storage projects have garnered as much as US$300 per $MtCO_2e$.[104]

B. Process for Trading in Voluntary Carbon Credits

The participants and processes in all voluntary carbon markets follow approximately the same model, as follows:

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[102] Sylvie Babarik, "Sustainability Action plan will include a roadmap toward carbon neutrality: Concordia's final plan is expected in early 2020" (24 October 2019), online: *Université Concordia University* <concordia.ca/cunews/main/stories/2019/10/24/sustainability-action-plan-will-include-a-roadmap-towards-carbon-neutrality.html>; "Payment of carbon credits from research grants" (27 November 2019), online: *Université de Montréal* <recherche-umontreal-ca.translate.goog/actualites-de-la-recherche/nouvelle/news/detail/News/paiement-de-credits-carbone-a-meme-les-subventions-de-recherche/?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp>; "Transforming our campus: Towards a law-carbon future at U of T St. George" (last visited 3 April 2022), online*: University of Toronto* <fs.utoronto.ca/sustainability/transforming-our-campus/>.

[103] Silvia Favasuli & Vandana Sebastian, "Voluntary carbon markets: how they work, how they're priced and who's involved", (10 June 2021) S&P Global Commodity Insights (blog), online: <spglobal.com/commodity-insights/en/market-insights/blogs/energy-transition/061021-voluntary-carbon-markets-pricing-participants-trading-corsia-credits>.

[104] *Ibid.*

(a) A private standards body sets standards for the recognition, verification and issuance of emission credits or other environmental attributes. This credit standards agency (the "Standard") typically approves accounting methodologies for the reduction, removal or avoidance of emissions from a variety of different activities undertaken in one or more industry sectors, all in accordance with a universally accepted international standard (e.g., ISO 14067:2018(en)).[105] These methodologies (described in part C below) are analogous to (and often substantively equivalent to) emission offset protocols approved by a governmental authority in a compliance market.

(b) An offset project developer (the "Generator") applies for recognition of its project or emissions-reducing activity with the Standard in accordance with one of the protocols recognized by the Standard.

(c) An independent third-party validation and verification body (the "Verification Body") verifies a Generator's claims to confirm it has generated notional reductions using an approved methodology as claimed. Each Standard approves or accredits its own suite of Verification Bodies. Typically, each Verification Body specializes

[105] "ISO 1467:2018(en) Green house gases: Carbon footprint of products – Requirements and guidelines for quantification" (last visited 24 March 2022), online: *ISO, Online Browsing Platform (OBP)* <iso.org/obp/ui/#iso:std:iso:14067:ed-1:v1:en> ["ISO 1467:2018(en)"]; see also "Clean Development Mechanism (CDM)" (last visited 24 March 2022), online: *Carbon Offset Guide* <offsetguide.org/understanding-carbon-offsets/carbon-offset-programs/united-nations-offset-mechanisms/clean-development-mechanism-cdm/>.

in validating and verifying carbon credits generated with specific sectoral scopes, meaning its expertise is geared towards the types of projects it audits.[106]

(d) Once a Verification Body audits and certifies a Generator's claims, the Standard grants and issues the Generator carbon credits, which are uploaded to the Standard's carbon registry and are then transferrable. Like emission offsets and other government-sanctioned carbon credits, one unit of carbon credit issued by a Standard usually represents one Mt of GHG emissions removed, reduced or avoided.

(e) Carbon credit buyers access the applicable carbon registry to identify voluntary carbon credits available for purchase from the Generator.

(f) A carbon credit purchase and sale transaction is effected between the Generator (or a broker, exchange or registry agent on behalf of the Generator) and the buyer. The buyer can hold the carbon credit or apply it as a notional set-off against GHG emissions. When so applied, the carbon credit is retired from the applicable registry and is no longer tradable.

C. The "Big 4" Standards

In the above model, which applies to all voluntary carbon markets, it is the Standard, a private agency, that acts as the equivalent of a government regulator in the compliance carbon market. Currently, an overwhelming majority (~95%) of all voluntary carbon credits certified and available

[106] See *TIER*, *supra* note 39, ss 27(1)-(6) (These independent auditors are akin to third party assurance providers under Alberta's *TIER* offset regime).

for purchase are generated and managed by one of four Standards:[107] (i) Verified Carbon Standard ("VCS"), representing approximately 50% of all contracted voluntary carbon credits;[108] (ii) Climate Action Reserve ("CAR"); (iii) Gold Standard; and (iv) American Carbon Registry (collectively, the "Big 4 Standards").

Together, the Big 4 Standards represented a voluntary carbon credit market of more than 239.3 $MtCO_2e$ in 2021, which grew 27% from 2020's high-water mark.[109] The estimated market for carbon credits could be worth upward of US$50 billion by 2030.[110] In 2021, participants traded over US$1 billion in voluntary carbon credits, with an estimated weighted average price of US$3.37 per $MtCO_2e$.[111]

[107] "Voluntary Offset Programs" (last visited 24 March 2022), online: *Carbon Offset Guide* <offsetguide.org/understanding-carbon-offsets/carbon-offset-programs/voluntary-offset-programs/>. See also Anja Kollmuss, Helge Zink & Clifford Polycarp, "Making Sense of the Voluntary Carbon Market: A comparison of Carbon Offset Standards" (March 2008) at 12-4, online (pdf): *WWF Germany* <globalcarbonproject.org/global/pdf/WWF_2008_A%20comparison%20of%20C%20offset%20Standards.pdf>.

[108] Verra, "Verified Carbon Standard: The World's leading voluntary GHG program" (last visited 24 March 2022), online: <verra.org/project/vcs-program/>.

[109] Stephen Donorio et al, "Markets in Motion: State of the Voluntary Carbon Markets 2021", (2022) at 4, online: *Ecosystem Marketplace* <forest-trends.org/publications/state-of-the-voluntary-carbon-markets-2021/>.

[110] See generally Christopher Blaufelder et al, "A blueprint for scaling voluntary carbon markets to meet the climate challenge", online: *(2021) McKinsey Sustainability Report* <mckinsey.com/business-functions/sustainability/our-insights/a-blueprint-for-scaling-voluntary-carbon-markets-to-meet-the-climate-challenge> (Estimate is by The Taskforce on Scaling Voluntary Carbon Markets, sponsored by the Institute of International Finance with support from McKinsey. The article states, "The Taskforce on Scaling Voluntary Carbon Markets (TSVCM), sponsored by the Institute of International Finance (IIF) with knowledge support from McKinsey, estimates that demand for carbon credits could increase by a factor of 15 or more by 2030 and by a factor of up to 100 by 2050. Overall, the market for carbon credits could be worth upward of $50 billion in 2030" at 2).

[111] "Voluntary Carbon Markets Top $1 Billion in 2021 with Newly Reported Trades: a Special Ecosystem Marketplace COP26 Bulletin" (10 November 2022), online: *Ecosystem Marketplace* <ecosystemmarketplace.com/articles/voluntary-carbon-markets-top-1-billion-in-2021-with-newly-reported-trades-special-ecosystem-marketplace-cop26-bulletin/>.

At the end of the first quarter of 2022, the top five host countries of non-retired volumes of carbon credits registered with the Big 4 Standards were India, China, Brazil, the United States and Indonesia (with 96, 55, 48, 46 and 42 million $MtCO_2e$, respectively); Canada's current non-retired volume is comparatively small at approximately 630,000 $MtCO_2e$.[112]

1. Verified Carbon Standard

Founded in 2005, the VCS claims to be the world's most widely used voluntary carbon credit program. Under this Standard, more than 1,700 projects have been approved and more than 877 million tradeable carbon credits, called Verified Carbon Units ("VCUs"), have been issued and listed for sale under the VCS's Verra Registry. In 2021, almost 300 million voluntary carbon credits were listed on the Verra Registry, more than twice as many as the previous year. The Verra Registry's carbon credits have been verified by over 20 approved Verification Bodies operating across five continents.

The VCS currently features 53 approved methodologies falling into one of 15 sectoral scopes, including energy (renewable/non-renewable), construction, transport, mining/mineral production fugitive emissions, waste handling and disposal and livestock and manure management.[113]

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[112] Climate Focus, "The Voluntary Carbon Market Dashboard" (last visited 8 April 2022), online: <climatefocus.com/initiatives/voluntary-carbon-market-dashboard> [VCM Dashboard].

[113] Verra, "Catalog of Approved Methodologies, Modules & Tools" (last visited 3 April 2022), online: <verra.org/project/vcs-program/methodologies/methodology-catalog/>; see also Verra, "VCS Sectoral Scopes" (last visited 24 March 2022), online: <verra.org/project/vcs-program/projects-and-jnr-programs/vcs-sectoral-scopes>.

Approximately half of all VCUs issued on the Verra Registry are issued under agriculture, forestry and other land use protocols.[114]

The Verra Registry is somewhat unique because it issues carbon credits that have been generated under the methodologies developed and approved by the VCS, new methodologies which project proponents are encouraged to submit for approval, and methodologies developed by other approved programs like the United Nations Clean Development Mechanism or the Climate Action Reserve (except for their forestry protocol). Notably, while the VCS has approved the quantification methodologies for certain project types from other standards agencies, it does not permit VCUs that are listed on the Verra Registry to be cross-listed on other registries (to avoid the risk of double counting).[115]

The Verra Registry also provides for VCUs to be labelled with certifications awarded by other, non-GHG programs that have been approved by VCS (i.e., community or biodiversity related certifications associated with the emissions-reducing project), thus allowing the VCUs with multiple program labels to be sold at a premium in the voluntary carbon market.

A significant proportion of projects listed on the Verra Registry originate in Asia, but the geographic distribution of total carbon credit volumes or their purchase is not publicly disclosed.

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[114] Verra, "Agriculture and Forestry Projects" (last visited 24 March 2022), online: <verra.org/project/vcs-program/projects-and-jnr-programs/agriculture-and-forestry-projects/>.

[115] Verra, "Verified Carbon Units (VCUs)" (last visited 24 March 2022), online (pdf): <verra.org/project/vcs-program/verified-carbon-units-vcus/>; see also VCS, "Double Counting: Clarification of Rules" (1 February 2012), online (pdf): <verra.org/wp-content/uploads/2018/03/VCS-Policy-Brief-Double-Counting_0.pdf>.

2. Climate Action Reserve

The CAR is likely the second most prolific and widely known voluntary carbon standard. It was founded in 2001 as the California Climate Action registry and is an arm of the California government. Unlike some other voluntary Standards, the CAR operates through both its own voluntary offset program, used by Generators and voluntary offtakers worldwide, and the California Compliance Offset Program, used by California compliance market participants.[116]

3. Gold Standard

The Gold Standard was founded in 2003 by the World Wildlife Fund in consortium with several other environmental non-governmental organizations, with the aim and claim of being the most rigorous carbon offset standards program in the world.[117]

Unlike VCS, which recognizes credits verified by one of several Verification Bodies, the Gold Standard requires all projects to undergo a project design review, performance review and certification by a single certifying body, SustainCert, prior to receiving and eligibility for one of the Gold Standard's registries. SustainCert is a spinoff of the Gold Standard Foundation.

The Gold Standard offers several different kinds of tradeable environmental attributes, however the two primary credits offered are certified emissions reductions ("CERs") for compliance targets and verified VERs.

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[116] Climate Action Reserve, "About Us" (last visited 24 March 2022), online: <climateactionreserve.org/about-us/>.

[117] Gold Standard, "Vision + Impacts", (last visited 24 March 2022), online: <goldstandard.org/about-us/vision-and-mission>.

Unlike its peers, the Gold Standard's Impact Registry is also developing a minimum pricing feature. A minimum price is applied for each different project type, calculated based on the Fairtrade carbon credit pricing model and designed to cover a Generator's average cost of setting up a sustainable carbon project of a particular project type. While the program is still under development, the Fairtrade minimum pricing for eligible project types is currently at the following prices per $MtCO_2e$—$12.71 for energy efficiency, $12.57 for renewable energy, and $21.34 for forestry management—each of which include a Fairtrade premium of an additional $1.38 per $MtCO_2e$.[118]

4. American Carbon Registry

The American Carbon Registry, a non-profit subsidiary of Winrock International, was founded in 1996 and claims to be the first private voluntary carbon registry in the world. They are an approved offset project registry for tradeable credits in California's cap-and-trade compliance market, but also maintain a public voluntary registry for carbon credits generated in the United States and elsewhere in accordance with the American Carbon Registry's approved protocols, which are sold as Emission Reduction Tons ("ERTs").[119]

As with other Standard registries, the American Carbon Registry provides for the registration, record of issuance, transfer and record of retirement of serialized carbon credits, but does not act

[118] Gold Standard, "CARBON PRICING: What is a carbon credit worth?" (last visited 24 March 2022), online: <goldstandard.org/blog-item/carbon-pricing-what-carbon-credit-worth>.

[119] American Carbon Registry, "American Carbon Registry: Harnessing the Power of Markets to Improve the Environment" (last visited 24 March 2022), online: <americancarbonregistry.org/>.

as a trading platform and the contracts for ERTs are executed directly between the buyer and seller outside the registry or via over-the-counter commodity trading platforms or services.[120]

D. Other Standards

There are other carbon standards and independent carbon credit registries proliferating in the marketplace for voluntary carbon credits besides the Big 4 Standards. One widely known example is the Western Climate Initiative, which provides technical and administrative support, a market registry and carbon credit auction services to its participating jurisdictions of California, Québec and Nova Scotia.[121] Another example is CSA Group, which offers training in GHG accounting, quantification and verification training and certification and maintains and administers independent, transparent registries on behalf of private and governmental organizations managing carbon emissions. The CSA Group is the contracted service provider that maintains the Alberta Emission Offset Registry and Alberta Emission Performance Credit Registry on behalf of the Alberta government.[122]

E. RECs and CECs

In addition to the voluntary carbon credits and Standards described above, there are also several standards bodies and a growing number of registries specific to compliance and voluntary RECs

[120] American Carbon Registry, "How it Works: What we Do" (last visited 24 March 2022), online: <americancarbonregistry.org/how-it-works/what-we-do>.

[121] WCI, Inc., "Our Work - Program Design and Implementation" (last visited 24 March 2022), online: <wci-inc.org/our-work/program-design-and-implementation>.

[122] CSA Group, "Training – Onsite: ISO 14064-1:2018 Greenhouse Gas Inventories & Measuring Carbon Footprint" (last visited 24 March 2022), online: <csagroup.org/store/product/50072450os/>; see also Government of Alberta, "Alberta Emission Offset System: The Emission Offset System enables compliance flexibility for facilities regulated under TIER" (last visited 24 March 2022), online: <alberta.ca/alberta-emission-offset-system.aspx>.

in use today. A REC is an instrument that is recognized in certain industry or regulatory contexts as proof that one megawatt-hour ("MWh") of electricity was generated from a low-impact renewable energy source. RECs (and potentially CECs, discussed below) can be purchased to meet legal obligations to procure a certain amount of electricity from non-emitting sources (e.g., in certain jurisdictions with renewable portfolio standards, such as New York State) or to support voluntary organizational targets and related claims about renewable or operational non-emitting electricity usage.[123] Compliance RECs trade at much higher prices than voluntary RECs, likely because compliance RECs must be generated from a defined geographic market and meet specific minimum regulatory standards. By contrast, voluntary RECs are not similarly constrained, and can vary widely in terms of their perceived value or "legitimacy" by prospective RECs purchasers. Therefore, there is much greater supply of voluntary RECs attributable to zero emitting electricity generation than compliance RECs. While there are no Canadian compliance REC markets, demand for voluntary RECs is robust among unregulated organizations and institutions seeking to reduce GHG emissions attributable to purchased (or self-generated) electricity.

CECs are a related form of environmental attribute also starting to find application in today's voluntary markets. CECs represent the environmental attributes associated with one MWh of

[123] New York State Energy Research and Development Authority, "Market-Based Environmental Protection Mechanisms and the Impact on Energy Production and Use: Final Report" (October 2011) at 18-21, online (pdf): <www.nyserda.ny.gov/-/media/Files/Publications/Research/Environmental/EMEP/Market-Based-Environmental-Protection-Mechanisms.pdf>. See also: United States Environmental Protection Agency, "Clean Energy Finance: Using Renewable Energy Certificates to Achieve Local Environmental Goals" (April 2021) at 6, online (pdf): <www.epa.gov/sites/default/files/2021-04/documents/usepa_renewableenergycertificates_april_2021.pdf>.

electricity generation from a non-emitting source (in particular, nuclear power), but which may not qualify as "renewable" in the criteria of applicable standards bodies.[124]

Currently in Canada the two main REC certification programs are the: (i) EcoLogo Program[125] and (ii) Green-e Program.[126] Both the EcoLogo Standard and Green-e Standard include only low-impact renewable energy sources (excluding nuclear). There is currently no relevant CEC-specific certification body in Canada.

F. Comparing and Contrasting Voluntary Carbon Standards

1. Similarities Among Voluntary Carbon Standards

The Standards and their voluntary carbon registries share a number of common features. Like carbon credits generated under compliance regimes, all voluntary carbon credits must meet minimum quality standards aligned with the principles of additionality, transparency, permanency, quantifiability and verifiability. In the absence of official government sanction, the Standards gain legitimacy and credibility by aligning their quantification methodologies with the globally

[124] See RE100 Climate Group and CDP, "RE100 Technical Criteria" (last modified 22 March 2021), online (pdf): <www.there100.org/sites/re100/files/2021-08/RE100%20Technical%20Criteria%20Aug%202021.pdf> (for instance the RE100, a large global corporate renewable energy initiative, whose published technical criteria limits eligible sources of "renewable" energy to geothermal, solar, sustainably sourced biomass (including biogas), hydropower and wind energy sources).

[125] UL, "Ecologo® Certification Program" (last visited 8 April 2022), online: <www.ul.com/resources/ecologo-certification-program> (the EcoLogo Program is administered only in Canada by UL, LLC ("UL"), the EcoLogo standard is UL 2854 ("EcoLogo Standard"), which stands for Sustainability for Renewable Low-Impact Electricity Products).

[126] Green-e, "Green-e® Energy" (last visited 8 April 2022), online: <www.green-e.org/programs/energy> (the Green-e Program is administered in North America by the Center for Resource Solutions ("CRS"); the key CRS standards documents (collectively, the "Green-e Standard") are: (a) the Green-e Renewable Standard for Canada and the United States (v.3.5), which is based on the Green-e Framework for Renewable Energy Certification (v.1.0); (b) the Green-e Energy Code of Conduct for Canada and the United States (v.2.3); and (c) the CRS Listed Tracking Attestation).

recognized International Organization for Standardization's ("ISO's") quality management standards. For instance, ISO 14067:2018(en) focuses on requirements and guidelines for quantifying the carbon footprint of products.[127]

Another commonality across voluntary carbon markets is that each Standard offers multiple methodologies, equivalent to emission offset protocols, for generating voluntary carbon credits. Common approved methodologies include: (i) energy production and distribution, (ii) waste handling and disposal and (iii) forestry and agricultural land management. As in a compliance regime, Generators can submit proposals to a Standard for its activities to receive recognition and eligibility for that Standard's carbon credit. As a result, the industry sectors eligible for voluntary carbon credits under the umbrella of one or more Standards are theoretically limitless, provided the sector offers an emissions-reducing activity or project which satisfies a Standard's methodology approval process. This contrasts with compliance market protocols, which in many cases statutorily restrict the economic sectors which can generate compliance carbon credits or consume them.[128]

Unlike most jurisdictions with regulated compliance carbon credit regimes, which require credits to be generated within and/or consumed or retired within the jurisdiction itself, voluntary carbon credits issued by the Standards on their registries are fungible across geographic boundaries. Provided they comply with a Standard's prescribed methodology and can withstand independent audit by an applicable Verification Body, voluntary carbon credits can be generated in any country,

[127] "ISO 1467:2018(en)", *supra* note 105.

[128] See e.g., *TIER*, *supra* note 39.

listed for sale on such Standard's registry and purchased by an offtaker anywhere in the world. Notably, however, although voluntary carbon credits listed on one Standard's carbon registry are geographically fungible and enjoy a broader potential marketplace of buyers than compliance credits, the Standards typically do not recognize each other's registries and do not often permit Generators to list credits from the same project on multiple registries.[129] This has started to limit certain Generators seeking to maximize carbon credit revenues, where different buyers of discrete portions of the output of a project may prefer different types of carbon credits or registries.

2. Differences Among Voluntary Carbon Standards

There are some notable differences between voluntary carbon credits issued by the Standards, both compared to compliance carbon credits and to each other.

One notable difference between compliance markets and voluntary markets is in the absence of supply constraints. In cap-and-trade compliance market models, the quantity of tradeable credits is finite and decreases over time. In some output-based or intensity-based compliance market models, such as Alberta's *TIER* regime, the volume of potential carbon credits is not capped but each emission offset or EPC is given an expiry date, regulated users are only permitted to use offsets for up to 60% of their compliance obligation,[130] and the market value of carbon offsets is

[129] See Verra, "Program Guide" (20 January 2022), online (pdf): <verra.org/wp-content/uploads/2022/01/VCS-Program-Guide_v4.1.pdf> (for example, s. 7 of the Verified Carbon Standard's Program Guide allows its program to approve a GHG program from outside its registry; however, it reserves the right to cancel credits under the approved program to convert them into its own credits—VCUs).

[130] *TIER*, *supra* note 39, s 13(9).

capped, which serve to effectively limit the balance of supply and demand for carbon credits under the regime.

Conversely, voluntary carbon credits are not volume-constrained by regulation. There is an infinite theoretical supply of credits under any Standard's protocols and no formal ceiling on trading price. This has resulted in explosive growth in the voluntary carbon credit market over the past several years. The primary constraint in the voluntary carbon market is that each Generator incurs capital and/or operating costs to undertake the activity or project generating voluntary carbon credits. These costs must be evaluated against the profit potential of the underlying project or emission-reducing activity. As such, the prevailing demand and prevailing market price for credits of a particular project type, from a particular geographic region or from a preferred Standard's approved methodologies, constrains the voluntary carbon market's scale. For example, carbon credits for older projects with limited co-benefits (such as increasing biodiversity and providing support for Indigenous peoples) can be found below US$1 per $MtCO_2e$, in contrast to prices greater than US$20 per $MtCO_2e$ for unique projects with such types of co-benefits.[131]

Other prominent differences between Standards include what each one calls a carbon credit, the number of eligible and available methodologies and industry sectors, the perceived quality and available volume of carbon credits, and the willingness to collaborate with other agencies in melding their initiatives. Fragmentation of the voluntary carbon markets, the heterogeneity of their product offerings, and the lack of transparency and fluidity of voluntary credit transactions are

[131] Turner et al, "Future Demand, Supply and Prices for Voluntary Carbon Credits – Keeping the Balance", Trove Research (1 June 2021), online (pdf): <trove-research.com/wp-content/uploads/2021/06/Trove-Research-Carbon-Credit-Demand-Supply-and-Prices-1-June-2021.pdf> [Trove Report].

unfortunate commonalities shared by both voluntary and compliance carbon markets. We discuss some of these challenges below.

VI. CANVASSING TRENDS IN THE OPERATION OF THESE MARKETS AND THEIR INTERPLAY

A. Data on How Emissions Products are Being Used

Compliance markets for carbon credits in Canada are relatively new and evolving, and there is very limited data on the use of different mechanisms for satisfying regulated emission limits. Alberta's industrial OBPS provides perhaps the most useful data, as the *TIER* framework, despite its multiple name changes, has been in place for approximately 15 years.

Data for Alberta's compliance carbon market collected between 2007 and 2020 shows that *TIER*-regulated facilities most commonly complied using Fund credits, which accounted for over 50% of the total excess emissions that facilities were required to offset with either Fund credits, EPCs, or emission offsets.[132] *TIER*-regulated facilities used emission offsets and performance credits to account for approximately 30% and 15%, respectively, of their total excess emissions over the same period.[133] This begs the question: given that emission offsets are expected to trade at a lower price than Fund credits, which act as a price ceiling, why did facilities not purchase and use more emission offsets? The answer, at least in part, likely relates to the limited emission offset supply in Alberta, administrative costs in offset generating and trading, and uncertainty in navigating

[132] Government of Alberta, "Specified Gas Emitters Regulation and Carbon Competitiveness Incentive Regulation Result" (2020), online: <open.alberta.ca/dataset/specified-gas-emitters-regulation-and-carbon-competitiveness-incentive-regulation-results> [SGER and CCIR Results]; see also Firefly GHG Consulting, "Compliance routes in Alberta's carbon markets: a look at past trends and future possibilities" (April 30, 2021), online: <fireflyghg.eco/post/an-animated-look-at-compliance-routes-in-alberta-s-carbon-market>.

[133] SGER and CCIR Results, *ibid*.

compliance options. However, offset use in Alberta's compliance market increased significantly after 2016,[134] especially offsets from wind electricity generation, tillage management and carbon capture and storage.[135]

Recent data from voluntary carbon markets shows that the financial services and chemical and petrochemical (including oil and gas) sectors make up nearly half the voluntary market carbon credit demand.[136] Between 2020 and 2021, the number of voluntary credits issued and retired on the Big 4 Standards nearly doubled, and the number of carbon credits issued on these Standards increased 10-fold.[137] Despite this growth, however, voluntary markets still represent a small fraction—less than 1%—of global GHG emissions.[138]

B. Challenges Encountered by Participants in Carbon Markets

1. Market Fragmentation and Limited Liquidity

Current and prospective participants in Canadian compliance carbon markets are challenged by the lack of a consolidated, liquid market across and between provincial and federal compliance regimes. A similar challenge plagues the voluntary markets. Liquidity challenges also arise because not all carbon credits are created equal as far as certifying bodies and ESG-focused buyers are concerned. They can be differentiated by myriad factors, including project type, technology

[134] *Ibid.*

[135] See Firefly GHG Consulting, "Where have Alberta's emission offsets come from? (A bar chart race)" (October 13, 2020), online: <fireflyghg.eco/post/where-have-alberta-s-emission-offsets-come-from-a-bar-chart-race>.

[136] Trove Report, *supra* note 131 at 7 and 8.

[137] VCM Dashboard, *supra* note 112 (Retirement data and non-retired volumes).

[138] Trove Report, *supra* note 131 at 2.

and geographic location. These differences make it difficult and complex for market participants to compare and value one credit against another across compliance and voluntary markets.

This is something readily apparent from our review of the federal and provincial regulatory structures set out in section IV, above, and is also a dynamic we observe in commercial contracts for carbon credits and offset project development. No provincial framework currently recognizes performance credits (i.e., credits issued to emitters that overachieve their respective limits or targets) that are generated in other provincial jurisdictions or under the federal OBPS. Except for the federal OBPS, which recognizes provincial and territorial emission offsets issued under ECCC-approved offset protocols,[139] there are also no regulations allowing buyers to purchase emission offsets generated by voluntary (or non-regulated) activities in one provincial jurisdiction or under the federal OBPS to use them for compliance obligations under another jurisdiction's OBPS. Rather than fostering a single large pool of many buyers and sellers of carbon credits, the current system shrinks and scatters buyers and sellers. It thereby limits Canada's compliance carbon market liquidity and the value of both performance credits and offsets within those markets.

As we discussed in Section V, carbon credits issued by any one Standard in the voluntary markets do not face the same fungibility limitations across geographic boundaries. However, the fact that Standards do not generally recognize each other's registries and in most cases do not allow

[139] *OBPS Regulations*, *supra* note 10, s 78(1)-(3) (these are currently limited to two B.C. protocols and a handful of Alberta protocols); see Environment and Climate Change Canada, "List of Recognized Offset Programs and Protocols for the Federal OBPS" (last modified March 7, 2022), online: <canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/list-recognized-offset-programs-protocols.html>; see also *TIER*, *supra* note 39, s 22(5).

Generators to list credits from the same project on multiple registries constrains liquidity in the voluntary markets across different voluntary registries.

In voluntary markets and compliance markets alike, liquidity challenges are compounded by the high cost of getting carbon credits verified, registered and issued by a Standard or regulatory agency. Smaller projects and producers may not attempt to register on the voluntary markets at all because the fixed costs are prohibitive to them; these pressures are leading some projects to seek RECs instead of voluntary carbon credits.[140]

With respect to emission offsets, compliance markets remain limited by a lack of emission offset quantification protocols. While the federal government and several provinces are currently developing offset quantification protocols, only Alberta has quantification protocols covering a modestly broad range of GHG emission reductions and removal activities. Delay in developing protocols to cover diverse activities restricts emission offset supply available as a compliance mechanism for regulated emitters and limits the incentives for project developers to develop large scale technologies and activities that most efficiently reduce, remove or sequester GHG emissions.

Another challenge facing increased fungibility of carbon credits across Canada today, and an issue we commonly encounter in renewable energy virtual power purchase agreements and emission reduction purchase agreements, is associated with the treatment of carbon products and contracts under existing Canadian securities laws. Although most transactions in carbon credits and RECs

[140] Patricia Pinter & Kanchan Yadav, "Reckoning with renewables: Appetite for I-RECs grows amid tightening of carbon credit rules" (last modified 1 March 2022), *S&P Global Commodity Insights*, online: <www.spglobal.com/commodity-insights/en/market-insights/latest-news/energy-transition/022822-reckoning-with-renewables-appetite-for-i-recs-grows-amid-tightening-of-carbon-credit-rules>.

in Canada today (whether in compliance or voluntary markets) transact on a bilateral (or sometimes brokered) over-the-counter ("OTC") basis and are exempt from OTC derivative regulations for non-financial commodities that are "intended to be physically delivered,"[141] if the underlying commodity is uniform and fully fungible, increased platform or exchanged-based transactions would be expected, which would raise different securities regulatory questions; for instance, whether the underlying contract might constitute an "exchange contract" for purposes of the *Securities Act* (Alberta) or a "futures contract" under the *Commodity Futures Act* (Ontario).

2. Market Price Discovery Value

Another limitation on the function and capability of carbon markets across Canada today is that they do not allow for any meaningful price discovery. As discussed in Section IV, the federal OBPS and various provincial output-based systems all provide for an emissions surcharge or purchasing equivalent of government fund credits as an alternative to reducing emissions or buying performance credits or offsets. The cost of this surcharge, which must remain in-step with the federal minimum standard across Canada, acts as a price ceiling for carbon credits because regulated emitters will not typically pay more for an offset than a compliance fund credit or emission surcharge unless the emitter sees additional benefit in buying (and associating itself) with emission offsets from a particular project or activity type. Data from Alberta's *TIER* program supports this, as it shows how carbon credits have traded at some level of discount below the

[141] See *Derivates: Product Determination*, ASC, NI 91-101, (30 September 2016) (same for all other jurisdictions except Ontario, this exemption resides in Section 2(1)(d) of Multilateral Instrument 91-101); but see D*erivates: Product Determination*, OSC, Rule 91-506 (section 2(1)(d) contains an equivalent exemption applicable only to Ontario).

prescribed cost of a Fund credit.[142] However, given transactions are determined by bilateral agreements under the *TIER* and other provincial OBPS regimes, in addition to there being an effective price ceiling prescribed by government, there is also very limited price transparency. These factors make it difficult for market participants to establish meaningful market pricing benchmarks for carbon credits in those compliance markets.

Although the absence of an analog for compliance fund credits or emission surcharges in the voluntary markets means there is no theoretical ceiling on voluntary carbon credit prices, voluntary carbon credit pricing remains low. Voluntary markets are still developing and experiencing a steady surplus of certain credit types. Low technological investment requirements for certain voluntary protocols on the market (e.g., nature-based solutions) is driving such credits to "unsustainably low" prices.[143] To combat this problem, some researchers are calling for the removal of surplus credits on Standards registries to increase the average price of voluntary carbon credits.[144] Since 2017, the non-retired volumes of credits on the Big 4 Standards have been increasing and they currently list a combined 571 million non-retired volumes of CO_2e.[145]

Despite the absence of a price ceiling in voluntary markets, low prices for carbon credits in voluntary markets have caused some Generators to focus on selling their carbon credits into compliance markets to garner higher prices for their carbon credits. Another reason Generators

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[142] See e.g., International Emissions Trading Association, "Carbon Market Business Brief: Alberta" (last modified June 2020) at 2-3, online (pdf): <ieta.org/resources/Resources/CarbonMarketBusinessBrief/CarbonMarketBusinessBriefAlberta2020.pdf>.

[143] Trove Report, *supra* note 131 at 45.

[144] *Ibid* at 45.

[145] VCM Dashboard, *supra* note 112 (Retirement data and non-retired volumes).

may choose to register their projects in compliance markets is that there is a smaller pool of credits in Canadian compliance markets than in the global voluntary pool for similar projects. For example, a Generator with an Alberta wind project seeking to bring its credits to the voluntary market will compete directly with all other wind projects listed on a particular Standard. If this Generator registers them under the *TIER* instead, the Generator may receive higher prices in the *TIER* market because it contains a pool of captive buyers who need to buy from the limited supply of *TIER* credits available in Alberta.

3. Uncertainty in Future Pricing

There continues to be significant uncertainty regarding the future price of carbon credits under both compliance and voluntary market systems. On one hand, carbon pricing certainty increased in 2021 with the SCC's decision to uphold the constitutionality of the federal *GGPPA*, which ensured, at least in the short term, that carbon credits generated under the federal OBPS or provincial systems could be expected to trade with reference to the prescribed federal minimum pricing standard. The federal government's plans to continue increasing that minimum carbon price to reach $170 per $MtCO_2e$ in 2030 signals that the price for compliance carbon credits may increase significantly over the next eight years.[146] However, this prospective increase in price remains a non-binding statement. There is no increase in carbon price prescribed under the federal *GGPPA* or any provincial regime beyond 2022, and the common practice to date has been to prescribe increases on a year-to-year basis, which does not provide stakeholders with long-term pricing certainty.

[146] 2023-2030 Update to the Pan-Canadian Approach, *supra* note 17.

The federal government acknowledged this price uncertainty concern in its *2030 Emissions Reduction Plan*. It proposed exploring measures that will help guarantee the future price of carbon pollution, including investment approaches like carbon contracts for differences (which would enshrine future price levels in contracts between the government and project investors, thereby de-risking private sector low-carbon investments) and legislative approaches to support a more durable price on GHG emissions.[147]

Another threat to long-term price certainty in compliance markets relates to the balance of supply and demand for emission offsets. As new emission offset quantification protocols continue to be developed in compliance markets across Canada, as well as in voluntary markets, more project developers are proceeding with projects to generate emission offsets. This is expected to grow the supply of emission offsets, and at a certain point, an increase in supply could flatten and even decrease prices if supply surpasses demand. In compliance markets, this risk of supply of compliance credits outstripping demand may be tempered to a degree by the expiration dates placed on carbon credits generated under OBPS regimes.

4. Credit Expiry and Verification Risk

Administration and transaction costs faced by market participants are another limiting factor in carbon markets. This is most apparent with respect to the generation of emission offsets for sale in both compliance and voluntary markets. On the compliance market side, using Alberta's *TIER* program as an example, project developers who want to enter the market by generating and selling

[147] See Environment and Climate Change Canada, "2030 Emissions Reduction Plan: Canada's Next Steps for Clean Air and a Strong Economy" (2022) at 27, online (pdf): <www.canada.ca/content/dam/eccc/documents/pdf/climate-change/erp/Canada-2030-Emissions-Reduction-Plan-eng.pdf>.

offsets must incur costs to register a project, verify offsets, submit requisite project and verification reports and negotiate bilateral agreements with buyers. Such costs are a barrier to entry for many new market participants.

Additional costs are incurred by market participants in assessing the potential liability between credit buyers and sellers if credits are deemed invalid at a date beyond the transaction date, and in negotiating appropriate mechanisms for addressing these types of risks. This consideration varies across compliance regimes. In Alberta, for example, *TIER* provides that the regulated emitter which submits performance credits or emission offsets for compliance will remain liable for its excess emissions in a compliance period if any such credits or offsets are later cancelled.[148]

5. Instability of Regulatory Regimes

Perhaps the greatest uncertainty for compliance market participants is the ever-looming possibility of government turnover and changes to regulatory regimes that could eliminate existing carbon markets. Ontario's dismantling of its GHG cap-and-trade program after a change in government in 2018 is one example of how quickly a new government can cancel a compliance market.[149]

In Alberta, while the industrial OBPS regime has been in place for 15 years, the wording of the *TIER* itself provides some caution to compliance market participants. It specifically stipulates that there is no legal entitlement to future emission offsets and EPCs,[150] meaning that, for example, if a project is developed in reliance on the current emissions reduction requirements and offset

[148] *TIER*, *supra* note 39, s 22(5).

[149] *Cap and Trade Cancellation Act*, 2018, SO 2018, c 13.

[150] *TIER*, *supra* note 39, s 22(7).

protocols under the *TIER* (e.g., by including revenues from generating *TIER* offsets in the project's business case), there is a risk that the regime will change and the project will be unable to generate and sell credits in subsequent years of the offset crediting period under *TIER* as initially contemplated.

The federal OBPS' presence as a backstop alleviates some provincial level uncertainty because, even where provincial governments change, new ones are still likely to maintain their existing compliance systems over the alternative of becoming subject to the federal regime. If the federal backstop is removed by a future federal government, this source of relative certainty disappears.

6. Additionality for Offset Validity

Another source of uncertainty for participants in compliance markets in Canada comes from the long-term viability of generating emission offsets from voluntary activities currently considered to have "additionality", but in the future will become business-as-usual or even required. This concept was first introduced in Section IV in the context of Alberta's *TIER* program, but most offset regimes require an activity to demonstrate additionality for it to qualify to produce recognized emission offsets.

As in Alberta, the federal government published criteria for assessing the additionality of certain activity types, and where additionality cannot be demonstrated for an activity, no quantification protocol will be developed to allow for the recognition of offset credits.[151] ECCC also conducts

[151] Environment and Climate Change Canada, *Carbon Pollution Pricing: Considerations for Protocol Development in the Federal Greenhouse Gas Offset System* (2020) at 5, online: <canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/carbon-pollution-pricing-considerations-protocol-development.html#toc10> [Federal Protocol Guidelines].

periodic reviews of existing federal offset protocols, and where the protocol is deemed to no longer to be additional, it may be withdrawn.[152] While several criteria may be used to assess additionality, a general rule is that, where an activity is a new or "first-of-its-kind" approach to achieving GHG emissions reduction, it will be considered additional, whereas, when an activity's "penetration rate" (i.e., its rate of uptake in a given sector) exceeds 40%, it will no longer be additional.[153] B.C.'s draft Offset Protocol Policy, which is not yet finalized, similarly includes additionality criteria for determining whether new emission offset protocols for particular activities should be developed, or whether existing protocols should be deactivated for becoming business-as-usual.[154]

Using Alberta's *TIER* as an example, the requirement of additionality for emission offset protocols means activities that currently qualify to generate offsets under *TIER*, such as solar and wind electricity generation and carbon capture and storage, may not qualify to generate emission offsets under *TIER* in the future if they become more commonplace. As noted above, this has already occurred, for example, with Alberta's *Quantification Protocol for Conservation Cropping*, which was in effect from April 2012 until December 31, 2021, at which time it was withdrawn because it was deemed no longer be additional.[155]

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[152] *Ibid* at 6.

[153] See Additionality Guideline, *supra* note 55, ss 2, 6; Federal Protocol Guidelines *supra* note 151 at 5-6.

[154] British Columbia Ministry of Environment and Climate Change Strategy, *B.C. Offset Protocol Policy: Draft for Public Consultation* (March 2022) at 2, 5, 7-8, online (pdf): <www2.gov.bc.ca/assets/gov/environment/climate-change/ind/protocol/draft_opp.pdf>.

[155] *Withdrawal of the Conservation Cropping Protocol*, *supra* note 58.

The federal government's launch of consultations on a federal Clean Electricity Standard[156] ("CES") also plays into the concerns around additionality and what it means for the long-term viability of emission offsets for prospective renewable electricity projects. According to ECCC's discussion paper on the CES, the federal government is planning a CES regulation that will set emissions performance standards for emitting electricity generators to ensure that the electricity sector transitions to net-zero emissions by 2035.[157] The discussion paper anticipates the use of compliance flexibilities such as emission offsets to allow emitting facilities to reach net-zero emissions, and for there to be synchronization between the CES regulation and the federal *OBPS Regulations*, but it does not mention the requirement that activities must be considered additional to continue generating offset credits.[158] There may be conflicting signals that arise from the CES regulation's drive to require "the phase-out of all conventional fossil fuel electricity generation"[159] by 2035 while the federal carbon pricing regime also maintains a requirement of additionality for offset credit-generating activities, meaning that it may impact eligibility for offset credit generation for renewable electricity projects as they cross the 40% penetration rate threshold.

[156] Environment and Climate Change Canada, "Canada launches consultations on a Clean Electricity Standard to achieve a net-zero emissions grid by 2035" (March 15, 2022), *News Release*, online: <canada.ca/en/environment-climate-change/news/2022/03/canada-launches-consultations-on-a-clean-electricity-standard-to-achieve-a-net-zero-emissions-grid-by-2035.html>.

[157] Environment and Climate Change Canada, "A Clean Electricity Standard in support of a net-zero electricity sector: discussion paper" (March 8, 2022) at 9 online: <canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/achieving-net-zero-emissions-electricity-generation-discussion-paper.html>.

[158] *Ibid* at 9-10.

[159] *Ibid* at 9.

The concern regarding withdrawal of emission offset quantification protocols also applies in voluntary markets, where Standards similarly require additionality for activities to qualify for the recognition of carbon credits under established protocols.

7. Splits Between Compliance and Voluntary Market Credits

Although we now increasingly see renewable energy projects seeking to "split" credits across or between compliance and voluntary markets, the various Standards have not created a comprehensive or cohesive set of rules to allow a single project to be listed across multiple voluntary registries, and neither have regional and national governments demonstrated a willingness to engage with cross-jurisdictional registration. Some certification bodies go further and have a "full aggregation rule", which expressly prohibits splitting environmental attributes for any project. In most cases, since Generators cannot optimize their market price by cross-listing credits on different markets, they are limited by the price they can garner on the registry on which they choose to list a project. To date, transacting parties often lump all types of environmental attributes into a single type and register them on one registry.

Much of the uncertainty and hesitation to cross-list a project arises because verifiers and regulators prioritize reducing the risk of double counting to bolster the legitimacy of environmental attributes. The resulting general lack of systemic flexibility to transact in more than one type and market of environmental attribute makes it difficult for Generators to decide which environmental attribute instrument they should be delivering under a project. For example, where tracking systems do not allow for partial meter readings, a project may struggle to issue both RECs and carbon offsets.[160]

[160] See, for instance, the operating rules of the Western Renewable Energy Generation Information System ("WREGIS") which is a large, web-based tracking system for RECs operated by the Western Electricity

This pressure is compounded by buyers in the carbon offset and REC markets seeking increasing environmental attribute differentiation to suit their individual needs.

Generators who find a buyer for only a portion of the credits a project will generate may struggle to find a buyer for the remainder of that project's credits. If a prospective buyer of the remaining credits prefers to purchase them from a different registry than the one the credits are already listed on, the Generator and second buyer may fail to complete their potential sale, unless the second buyer will accept the remaining credits from the Standard on which they are already registered. To avoid this dilemma, Generators often wait to sell their available credits for a given project until they find a single buyer to purchase the whole lot (or significant majority) of credits, which limits their buyer pool.

C. Opportunities Arising from Ongoing Evolution of Carbon Markets

Although Canada's carbon markets are developing in a patchwork framework marked by fragmentation and many uncertainties for market participants, they undoubtedly provide for various evolving options for compliance credits and voluntary carbon finance tools, and significant growth prospects. As discussed in Section V, global trends towards carbon neutrality targets for large private and public organizations, as well as ESG-oriented investing, signal significant growth potential for the demand volume and pricing of carbon credits in voluntary markets. We expect these voluntary markets will continue growing as more organizations and industry sectors adopt net-zero targets and seek financial products to hedge against the financial risks posed by the clean

Coordination Council, which effectively prohibits the simultaneous registration of RECs. In contrast with WREGIS, the TIER rules allow Generators to state their intention to register a portion of a project's capacity for the purposes of generating TIER offsets.

energy transition and climate change. This growth means more opportunities for existing and prospective market participants.

In compliance markets, we expect demand to grow as more emitters become subject to OBPS regimes or cap-and-trade systems with carbon credits (or allowances) provided as compliance mechanisms, and as emission limits are reduced over time. Notwithstanding the uncertainties regarding emission offsets already discussed, these offsets continue to provide an attractive incentive for project developers looking to enter compliance markets by generating credits on a large-scale through GHG emissions reduction, removal, or capture activities, and the range of activities qualifying for emission offset generation is currently growing across Canada.

The limited selection of offset quantification protocols in both compliance and voluntary markets is another area of opportunity for prospective and existing carbon market participants. For one, participants in compliance markets can lobby governments to adopt offset quantification protocols for new and evolving emission reduction activities to help make a better financial case for project developers interested in engaging in such activities. Participants in voluntary markets can similarly advocate with private standards bodies for the recognition of a wider range of offset protocols to allow for the generation and sale of credits for new activities in voluntary markets.

As we already discussed in Section IV.B., ECCC had two draft protocols out for public consultation in early 2022 and is developing five other federal offset protocols.[161] As it did for the Landfill Methane Recovery and Destruction and Reducing Greenhouse Gas Emissions from

[161] Federal Greenhouse Gas Offset System, *supra* note 23 (these are Reducing Greenhouse Gas Emissions from Refrigeration Systems, Improved Forest Management, Landfill Methane Recovery and Destruction, Enhanced Soil Organic Carbon and Livestock Feed Management).

Refrigeration Systems protocols, ECCC will likely soon seek public input on these five remaining federal offset protocols. We do note ECCC states it will consider developing protocols for additional project types in the future, which could provide opportunities for participants in these markets who want to have their activities recognized to pitch ideas for novel compliance protocols.[162]

Participants in both compliance and voluntary markets may also consider lobbying their respective governments or private standards body on how additionality is assessed for emission offset activities. With respect to compliance markets in Canada, specifically, with the prevailing objective becoming not only emissions reduction, but net-zero emissions, and perhaps even net-removal in the distant future, it may be counterproductive (and certainly, unhelpful to project developers as emission offset generators and sellers) to withdraw offset quantification protocols over time for any offset activities that have more than 40% uptake in a sector.

Another opportunity for improvement to compliance markets is for governments (on their own volition and/or at the request of market participants) to increase the certainty of value and long-term life of EPCs and emission offsets (to use the *TIER* vernacular). Regulatory regimes that provide for a legislated increase of minimum carbon pricing into the future, guaranteed legal entitlement for properly generated and verified credits, and long-term certainty for the existing carbon market regime, will increase the recognized value of credits and offsets, improve leverage available for emission offsets in projects and encourage more market participation.

[162] *Ibid.*

Technologies are enhancing the quantifiability and verifiability of carbon credits, which should in turn increase their market value and the profitability associated with generating such credits. These developments are making it cheaper, faster and easier for Generators to participate in the carbon markets. One example is the use of drone technology to physically verify activity and the status of land. A drone can pass over large amounts of forest to support estimates of how much carbon is sequestered in an area. Another example is the use of blockchain to issue tokenized carbon credits, which theoretically will allow participants to trade carbon credits in a more transparent, secure, traceable and easily verifiable manner than using traditional methods.[163] Blockchain technology is also promising to reduce the risk of double counting by helping market participants track and verify the origins of individual credits (or constituent activity elements embodied in individual credits). Technologies that reduce the costs associated with quantifying and verifying carbon credits offer promising paths to increasing the profitability and provenance of such credits, and the robustness of the markets within which they are sold.

Lastly, there remains significant opportunity to reduce carbon market fragmentation across Canada, and thereby contribute to greater market optionality and liquidity. This is particularly challenging for the level of interjurisdictional cooperation it requires for the federal and various provincial regimes to allow for the recognition and trade of carbon credits across provincial borders. However, the process provided under the federal *OBPS Regulations* for recognizing offset

[163] See JustCarbon, "The marketplace that simplifies offsetting carbon emissions while supporting high-quality carbon sequestration projects" (last visited 8 April 2022), online: <www.justcarbon.com/> (for example Verra credits are tradeable on this platform); Likvidi, "Bringing carbon to crypto: Likvidi Carbon Platform" (last visited 8 April 2022), online: <www.likvidi.com> (another tradeable platform example but using blockchain technology).

credits issued by certain provincial programs and under approved provincial offset quantification protocols is an example of what can be done to move towards market harmonization.

Voluntary markets already provide for greater fungibility of carbon credits across borders in comparison to compliance markets. However, if greater integration is achieved between different Standards and registries, this would provide an even larger pool of buyers and sellers and create a stronger decentralized carbon market. This outcome may be achievable through private standards bodies with support from demand exerted by market participants.

VII. CONCLUSIONS

In this paper we provided a snapshot of compliance carbon markets across Canada and the growing trade in carbon credits or otherwise identified environmental attributes on the global voluntary carbon market. The landscape continues to change rapidly, with new private and public bodies, as well as nations and provinces, regularly setting net-zero emission targets, and with Canada's federal and provincial governments frequently releasing new regulatory developments on GHG emission pricing and offset protocols. While market participants—in both compliance and voluntary markets—continue to face significant challenges and uncertainties that constrain low-carbon investments to capitalize on carbon credits and environmental attributes, these markets continue to grow and present significant financing opportunities. With an increasing number of data points for voluntary markets, as well as compliance markets, most notably in Alberta, and the identification of challenges and delays in existing frameworks, there is good reason to hope that the regulatory landscape supporting carbon finance in Canada will (sooner rather than later) come into better focus and further support acceleration of investment in GHG emissions reduction.