THE EVOLUTION OF CANADA'S CARBON MARKETS AND THEIR ROLE IN ENERGY TRANSITION

JAKE SADIKMAN, SANDER DUNCANSON, DANA SARIC,
COLEMAN BRINKER, STEPHAN PACHOLOK, AND LANDON MILLER*

The tapestry of compliance and voluntary market mechanisms for carbon and other environmental attributes in Canada's infrastructure capital markets reflects the almost 30-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 toward climate-focused investment criteria and technology-bolstered acceleration toward 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.

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 , *market expectations were high (and perhaps still are) that the regulatory landscape supporting carbon finance in Canada would finally come into better focus. This article 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.*

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* Jake Sadikman is a Partner at Osler, Hoskin & Harcourt LLP, active in the firm's Energy Group and Construction and Infrastructure Group. Sander Duncanson is a Partner at Osler, Hoskin & Harcourt LLP and is Co-Chair of the firm's Regulatory, Environment, Indigenous & Land Group. Dana Saric is Senior Counsel at Capital Power Corporation and Landon Miller is Counsel at Imperial Oil Limited. Coleman Brinker is an Associate in Osler, Hoskin & Harcourt LLP's Regulatory, Environment, Indigenous & Land Group and Stephan Pacholok is an Associate in Blake, Cassels & Graydon LLP's Financial Services Group. Additional recognition is owed to Andrew Duran and Aayush Bhawani for their diligent research and citation assistance.

I. INTRODUCTION

In the almost 30 years since the concept of emissions trading began occupying the consciousness of Canadians some might argue not a lot has changed. Governments, policy-makers, 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 toward 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.[1] Instead, subnational 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 carbon and other environmental attributes now have

[1] See generally Environment and Climate Change Canada, *2020 Expert Assessment of Carbon Pricing Systems: A Report Prepared by the Canadian Institute for Climate Choices*, by D Sawyer et al, Catalogue No En4-434/2021E-PDF (Gatineau: Environment and Climate Change Canada, 2021) at 9–10, 14–17, 87, online: <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 Environment and Climate Change Canada, *Pan-Canadian Framework on Clean Growth and Climate Change: Canada's Plan to Address Climate Change and Grow the Economy*, Catalogue No En4-294/2016E-PDF (Gatineau: Environmental and Climate Change Canada, 2016), online: <publications.gc.ca/collections/collection_2017/eccc/En4-294-2016-eng.pdf>.

decades of experience and are poised to play a critical role in the next era of Canada's transition toward a low carbon economy.

This article 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.[2] 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.

II. 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), and so on). 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: (1) cap-and-trade mechanisms; and (2) 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

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[2] Goldy Hyder, "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: <thebusinesscouncil.ca/app/uploads/2021/04/Clean-Growth-3.0.pdf>.

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.[3] 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 the utmost importance.

III. 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*[4] to regulate GHG emissions through minimum carbon pricing standards in the *Greenhouse Gas Pollution Pricing Act*,[5] a majority of the Supreme Court of Canada concluded in *References re Greenhouse Gas Pollution Pricing Act*[6] that the *GGPPA* is constitutional and that the 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]

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3 Montréal Exchange, Press Release, "The Montréal Climate Exchange Is Established: A Partnership Between the Montréal Exchange and the Chicago Climate Exchange" (12 July 2006), online: <www.m-x.ca/f_comm_press_en/011-06_en.pdf>.

4 *Constitution Act, 1867* (UK), 30 & 31 Vict, c 3, reprinted in RSC 1985, Appendix II, No 5.

5 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," 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>.

6 2021 SCC 11.

7 *Ibid* at paras 80–82, 200, 206.

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 distributors (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 1 April 2020, the federal backstops covered an estimated 31 percent of Canada's GHG emissions, and provincial and territorial systems combined to cover an additional estimated 47 percent of Canada's emissions.[9]

2. FEDERAL OBPS AND COMPLIANCE MARKET

The federal OBPS applies to facilities that: (1) are located in a jurisdiction that does not meet the federal minimum GHG pricing stringency; (2) emit 50,000 Mt of carbon dioxide equivalent ($MtCO_2e$) or more annually; and (3) 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 *OBPS Regulations*.[13] Covered facilities must report on their annual emissions and production and compensate for any emissions above their emissions limits.[14] A covered facility with

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8 Discussion of the fuel charge in the *GGPPA*, *supra* note 5, is beyond the scope of this article.

9 Environment and Climate Change Canada, *Pan-Canadian Approach to Pricing Carbon Pollution: Interim Report 2020*, Catalogue No En4-423/1-2021E-PDF (Gatineau: Environment and Climate Change Canada, 2021) at 3, online: <publications.gc.ca/collections/collection_2021/eccc/En4-423-1-2021-eng.pdf>.

10 *GGPPA*, *supra* note 5, 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 include: (1) oil and gas production; (2) mineral processing; (3) chemical production; (4) pharmaceutical production; (5) iron, steel, and metal production; (6) mining and ore processing; (7) fertilizer production; (8) food processing; (9) pulp and paper processing; (10) automotive assembly; and (11) electricity generation: *OBPS Regulations*, *ibid*, Schedule 1).

11 *GGPPA*, *ibid*, s 172; see generally Environment and Climate Change Canada, *Policy Regarding Voluntary Participation in the Output-Based Pricing System*, Catalogue No En4-358/2018E-PDF (Gatineau: Environment and Climate Change Canada, 2018), 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 *OBPS Regulations*, *supra* note 10.

14 *GGPPA*, *supra* note 5, ss 173–74(1).

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 $MtCO_2e$.[15]

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: (1) making an excess emissions surcharge payment electronically to the Receiver General for Canada; or (2) 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.[16]

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.[17] 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).[18] 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.

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.[19]

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[20] and program[21] that is set out in a list published by Environment and Climate Change Canada (ECCC).[22] As of 1 January 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.[23]

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15 *Ibid*, s 175; see also *OBPS Regulations*, *supra* note 10, s 59.

16 *GGPPA*, *ibid*, s 174(2); see also Environment and Climate Change Canada, *Overview: Output-Based Pricing System Regulations Under the Greenhouse Gas Pollution Pricing Act* (Gatineau: Environment and Climate Change Canada, 2019) at 4–5, online: <www.canada.ca/content/dam/eccc/documents/pdf/obps/Document-A-EN.pdf>.

17 *GGPPA*, *ibid*, Schedule 4.

18 Environment and Climate Change Canada, "Update to the Pan-Canadian Approach to Carbon Pollution Pricing 2023-2030," 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> [ECCC, "2023-2030 Update to the Pan-Canadian Approach"].

19 *OBPS Regulations*, *supra* note 10, ss 70–71.

20 An offset protocol is a methodology for quantifying GHG reductions generated by given activities.

21 An offset program is a system allowing for the generation and tracking of credits.

22 *OBPS Regulations*, *supra* note 10, ss 78(1)–(3).

23 See Environment and Climate Change Canada, "List of Recognized Offset Programs and Protocols for the Federal OBPS," 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>.

The federal government has also recently developed a system for federal offset credits made up of three main components: (1) the *Canadian Greenhouse Gas Offset Credit System Regulations*,[24] which establish the framework for offset credit generation and authorize the issuance of credits and the creation of offset protocols; (2) offset protocols under development 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.[25] To date, ECCC has finalized one federal offset protocol for landfill methane recovery and destruction, and it is in the process of developing further offset protocols for improved forest management, enhanced soil organic carbon and livestock feed management, reducing GHG emissions from refrigeration systems, and direct air carbon capture and sequestration.[26]

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.[27]

For brevity in this article, 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 uses its own economy-wide carbon tax as its primary mechanism to price GHG emissions within the province. However, British Columbia 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

British Columbia's *Greenhouse Gas Industrial Reporting and Control Act* establishes GHG emission limits for certain industrial facilities or sectors.[28] At present, the *GGIRCA* only regulates liquefied natural gas facilities operations.[29] 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: (1) earning or purchasing emissions offsets from approved emission offset projects; (2) applying earned credits from

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24 SOR/2022-111.

25 Environment and Climate Change Canada, "Canada's Greenhouse Gas Offset Credit System," online: <www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/federal-greenhouse-gas-offset-system.html> [ECCC, "Canada's Greenhouse Gas Offset Credit System"].

26 *Ibid*.

27 For an overview of the systems in place in Canada, see Environment and Climate Change Canada, "Carbon Pollution Pricing Systems Across Canada," online: <www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work.html>.

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

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

prior years or from third party regulated facility operators; or (3) purchasing government-generated credits ("funded units").[30]

Under the *GGIRCA*, covered facilities may use British Columbia offset unit equivalents from another jurisdiction to comply with *GGIRCA*'s emission benchmarks.[31] However, at present, no regulations provide for unit equivalency from other jurisdictions.

The *Greenhouse Gas Emission Control Regulation*,[32] adopted under the *GGIRCA*, establishes the British Columbia 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 offsets from the market or funded units from the British Columbia government. Funded units currently cost $25 per $MtCO_2e$.[33]

Emission offsets may be generated in British Columbia by removing or reducing GHG emissions via approved emission offset projects, developed in accordance with an approved emission offset protocol.[34] As of 1 April 2022, reducing emissions through energy conservation, energy efficiency, and switching to lower carbon fuels is the only approved emission offset protocol.[35] 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.[36]

In addition to the compliance market created by the *GGIRCA*, public sector organizations, including the British Columbia government, must be carbon neutral each year under the *Climate Change Accountability Act*.[37] If they fail to achieve carbon neutrality by reducing their attributed GHG emissions under the *Carbon Neutral Government Regulation*,[38] the organization must acquire emission offset units under the *GGIRCA*.[39]

E. ALBERTA

1. PROVINCIAL OBPS AND COMPLIANCE MARKET

Alberta's OBPS for industrial facilities is implemented by the *Technology Innovation and Emissions Reduction Regulation*,[40] under Alberta's *Emissions Management and Climate Resilience Act*.[41] The *TIER* represents the latest in several revisions to Alberta's GHG pricing

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30 *Ibid*, ss 6(2), 8–12.
31 *Ibid*, ss 1(1) "compliance unit," "recognized unit," 14(2).
32 BC Reg 250/2015 [*GGECR*].
33 *Ibid*, s 28.
34 *GGIRCA*, *supra* note 28, ss 8–10; *GGECR*, *ibid*, ss 11–27.
35 British Columbia, Ministry of Environment and Climate Change Strategy, *British Columbia Greenhouse Gas Offset Protocol: Fuel Switch*, v 1.1 (British Columbia: Ministry of Environment and Climate Change Strategy, 2019), online: <www2.gov.bc.ca/assets/gov/environment/climate-change/ind/protocol/bc_fuel_switch_protocol_2019.pdf>.
36 Government of British Columbia, "Developing Emission Offset Projects," online: <www2.gov.bc.ca/gov/content/environment/climate-change/industry/offset-projects/develop>.
37 SBC 2007, c 42, s 5(1) [*CCAA*].
38 BC Reg 392/2008.
39 *CCAA*, *supra* note 37, s 6; *GGIRCA*, *supra* note 28, s 1(1) "offset unit."
40 Alta Reg 133/2019 [*TIER*].
41 SA 2003, c E-7.8.

regime for industrial emissions and was first instituted under the now expired *Specified Gas Emitters Regulation* in 2007.[42] It applies to approximately 60 percent of Alberta's emissions.[43]

The *TIER* applies to Alberta facilities emitting 100,000 Mt or more of GHG emissions annually.[44] A facility emitting less than 100,000 Mt of GHG may voluntarily apply to be subject to the *TIER*.[45] *TIER*-regulated facilities have allowable emissions limits determined based on emissions intensity benchmarks specific to their facility or industry.[46]

TIER-regulated facilities have four means of complying with *TIER* emissions limits: (1) reduce their emissions via increasing year-over-year operating efficiencies; (2) contributing the requisite fee to the *TIER* Fund to obtain a "fund credit" for each Mt of excess emissions;[47] (3) using emission performance credits (EPCs) generated by another *TIER*-regulated facility;[48] or (4) using emission offsets generated by facilities that voluntarily reduce or sequester GHG emissions, in accordance with an approved emission offset protocol.[49]

The cost to obtain *TIER* fund credits is set each year by Ministerial Order, which increased in step with the excess emissions surcharge under the federal OBPS to $50 per Mt in 2022.[50] As of the date of this article, 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.[51] EPCs issued for 2017 or a subsequent year may only be used to satisfy *TIER* requirements for eight years before the credit expires.[52]

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,[53] the *Standard for Greenhouse Gas Emission Offset Project Developers (Emission Offset Standard)*,[54] and an approved offset

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42 Alta Reg 139/2007. Note this regulation expired on 31 December 2017.

43 Government of Alberta, "Technology Innovation and Emissions Reduction Regulation," online: <alberta.ca/technology-innovation-and-emissions-reduction-regulation.aspx>.

44 *TIER*, *supra* note 40, ss 1(1)(cc), 9, 12.

45 *Ibid*, ss 4–5.

46 *Ibid*, ss 9–12.

47 *Ibid*, s 21.

48 *Ibid*, s 20.

49 *Ibid*, s 19.

50 *Ibid*, s 21(2); Alberta, Environment and Parks, *Ministerial Order 87/2021* (1 December 2021) (*Emissions Management and Climate Resilience Act*).

51 *TIER*, *ibid*, s 20.

52 *Ibid*, s 13(6).

53 *Ibid*, ss 18–19.

54 Alberta, Environment and Parks, *Standard for Greenhouse Gas Emission Offset Project Developers: Technology, Innovation, and Emissions Reductions Regulation*, v 3.0 (Edmonton: Alberta Environment and Parks, 13 November 2019), online: <open.alberta.ca/dataset/ba00d7a0-e37b-4792-a050-f56bfd968187/resource/33fa6665-7dfb-4483-8639-c8bb1a5d695a/download/aep-standard-for-emission-offset-project-developers-v3-2019-11.pdf> [Alberta, *Emission Offset Standard*].

quantification protocol. Emission offsets are serialized and publicly listed on the Alberta Emission Offset Registry.[55]

As of 1 April 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.[56]

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.[57]

Under the *TIER*, activities must be able to demonstrate "additionality," meaning they must go beyond "business-as-usual," to generate valid emission offsets.[58] Alberta's *Technical Guidance for the Assessment of Additionality* establishes 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.[59] The Government of Alberta may withdraw a protocol when an activity covered by an emission offset quantification protocol is determined to no longer be additional in terms of its GHG emissions reductions, removal, or capture.[60] For instance, the *Quantification Protocol for Conservation Cropping* was withdrawn following an additionality assessment that determined that 60 to 75 percent of applicable farmland was implementing the no-tillage techniques without reliance on the protocol.[61] Once withdrawn, new offset projects for the generation of emission offsets for the activity covered by that protocol will not be approved.

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55 CSA Group, "Alberta Carbon Registries," online: <alberta.csaregistries.ca/>.

56 Government of Alberta, "Alberta Emission Offset System," online: <alberta.ca/alberta-emission-offset-system.aspx>.

57 *TIER*, *supra* note 40, s 13(5).

58 Alberta, *Technical Guidance for the Assessment of Additionality*, v 1.0 (Edmonton: Alberta Environment and Parks, 31 May 2018), online: <open.alberta.ca/dataset/ae43faff-6405-443d-a07a-d541d04c52f0/resource/679a62bd-7196-4665-a6b7-341af6d96578/download/assessmentadditionality-may31-2018.pdf> [Alberta, *Additionality Guideline*].

59 *Ibid*, ss 2–5.

60 Alberta, *Emission Offset Standard*, *supra* note 54, Part 1, s 6 and Part 2, ss 1.8–1.9; see also Government of Alberta, *Additionality Guideline*, *ibid*, s 2.

61 Alberta, Environment and Parks, *Additionality Assessment of the Quantification Protocol for Conservation Cropping* (Version 1.0) (*Conservation Cropping Protocol*) (Memorandum), by Justin Wheeler (Edmonton: Alberta Environment and Parks, 18 November 2019), online: <www.alberta.ca/assets/documents/aep-memo-to-stakeholders-conservation-cropping-additionality.pdf>; Alberta, Environment and Parks, *Withdrawal of the Quantification Protocol for Conservation Cropping, Version 1.0 April 2012* (Memorandum), by Justin Wheeler (Edmonton: Alberta Environment and Parks, 10 December 2020), online: <alberta.ca/assets/documents/aeos-memo-with drawal-quantification-protocol-conservation-cropping.pdf> [Alberta, *Withdrawal of the Conservation Cropping Protocol*].

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[62] 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.[63] The OBPS is implemented through *The Management and Reduction of Greenhouse Gases (Standards and Compliance) Regulations*,[64] 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.[65] Facilities emitting between 10,000 and 25,000 $MtCO_2e$ per year can also request to become regulated emitters under the *MRGG Regulations*.[66] 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 1 January 2022;[67] 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.[68] 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.[69] Other compliance options include using emission offsets or performance credits, as approved by the Saskatchewan Ministry of Environment.[70] The per Mt fee for excess emissions payable to the Technology Fund is set at $50 per Mt for 2022.[71]

Because Saskatchewan's OBPS only partially meets federal minimum standards, the federal GHG pricing system applies to emission sources not covered by the *MRGGA*.

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62 SS 2010, c M-2.01 [*MRGGA*].
63 *Ibid*, ss 16.1, 17.
64 RRS c M-2.01, Reg 3 [*MRGG Regulations*].
65 *Ibid*, ss 3(1), 3(7), 5, Appendix, Table 1.
66 *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).
67 Amendment (Saskatchewan Ministry of Environment), (2021) S Gaz I, 3904 (*The Management and Reduction of Greenhouse Gases Act*).
68 *MRGG Regulations*, *supra* note 64, s 17(1).
69 *Ibid*, s 18(2).
70 *Ibid*, ss 18(2), 20.
71 *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 ($50/tonne CO_2e in 2022)*, OC 616/2021 (2021).

Emission sources covered by the federal OBPS regime include electricity generation and natural gas transmission pipelines.[72]

2. PERFORMANCE CREDITS AND OFFSETS

Saskatchewan has adopted the *Management and Reduction of Greenhouse Gases (Performance Credit) Standard* under the *MRGG Regulations* to provide standards for earning, using, purchasing, selling, and retiring performance credits.[73] Under the *Performance Credit Standard*, a regulated facility can earn a performance credit if its total annual emissions are below its emissions limit.[74] Performance credits must be serialized and registered in Saskatchewan's credit registry to be valid for a regulated emitter to "retire" a performance credit as a means of fulfilling a compliance obligation.[75] Performance credits in Saskatchewan have no expiration date.[76]

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,[77] 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 the *MRGGA* does not already regulate.[78] 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.[79] 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.[80]

G. ONTARIO

On 1 January 2022, Ontario officially transitioned from the federal OBPS to its own OBPS for large industrial emitters.[81] The federal OBPS previously applied in Ontario since it came into effect on 1 January 2019, after Ontario cancelled its GHG cap-and-trade program in July 2018.[82]

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

73 *MRGG Regulations*, *supra* note 64, s 4(1); Saskatchewan, *The Management and Reduction of Greenhouse Gases (Performance Credit) Standard* (Regina: Ministry of Environment, August 2021), online: <publications.saskatchewan.ca/#/products/114646> [Saskatchewan, *Performance Credit Standard*].

74 Saskatchewan, *Performance Credit Standard*, *ibid*, ss 2–3.

75 *Ibid*, ss 4(3)–(4).

76 *Ibid*, s 4(8).

77 *MRGGA*, *supra* note 62, s 2.

78 Government of Saskatchewan, Ministry of Environment, *Saskatchewan Greenhouse Gas Offset Program: Proposal Paper* (Saskatoon: Ministry of Environment, February 2021), online (pdf): <pub-saskatoon.escribemeetings.com/filestream.ashx?DocumentId=142161>.

79 *Ibid* at 3, 7.

80 *Ibid* at 16.

81 *Order Amending Part 2 of Schedule 1 to the Greenhouse Gas Pollution Pricing Act*, SOR/2021-195 (2021) C Gaz II, 2700.

82 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, as repealed by O Reg 467/18, s 1.

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 Emissions Performance Standards*, which came into full effect on 1 January 2022.[83]

The *EPS Standards* apply to industrial facilities with annual emissions of at least 50,000 $MtCO_2e$ in regulated sectors.[84] Smaller facilities with annual emissions between 10,000 and 50,000 $MtCO_2e$ can apply to voluntarily opt in to the *EPS Standards*.[85]

The *EPS Standards* require facilities they regulate to reduce emissions below an annual output-based emissions limit, or, if they exceed their limit, to satisfy a compliance obligation for excess emissions.[86] 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*.[87] 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.[88]

A facility's compliance obligation under the *EPS Standards* is the difference between its total emissions and its annual emissions limit.[89] A covered facility can satisfy its compliance obligation by submitting compliance instruments, which currently include excess emissions units and emissions performance units.[90] 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.[91] 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 $MtCO_2e$.[92] Unlike excess emissions units, emissions performance units can be banked or traded with other covered facilities in the program.[93] However, emissions performance units expire after five years.[94]

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83 O Reg 241/19 [*EPS Standards*].
84 *Ibid*, s 2(2).
85 *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).
86 *Ibid*, s 13.
87 Ontario, Ministry of the Environment, Conservation and Parks, *GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit* (Toronto: Ministry of the Environment, Conservation and Parks, October 2021), online (pdf): <www.ontariocanada.com/registry/showAttachment.do?attachmentId=51425&postingId=37527>.
88 *Ibid* at 5–28.
89 *EPS Standards*, *supra* note 83, s 13(2).
90 *Ibid*, s 1(1).
91 *Ibid*, ss 9, 11(9).
92 *Ibid*, s 16(1).
93 *Ibid*, ss 11(5), 19.
94 *Ibid*, s 11(5).

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*[95] and *Management of Greenhouse Gas Regulations*.[96]

The *MGGA* makes onshore and offshore large industrial facilities and large-scale electricity generation subject to annual emission targets.[97] Facilities emitting more than 25,000 $MtCO_2e$ are required to reduce their emissions by 10 percent in 2021, and by 12 percent in 2022.[98] Facilities emitting between 15,000 and 25,000 $MtCO_2e$ annually may apply to opt in to the *MGGA*.[99]

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.[100] These credits can take one of three forms, including: (1) Greenhouse Gas Reduction Fund credits, priced at $50 per $MtCO_2e$ for 2022; (2) performance credits awarded to a regulated facility for over-achieving its emission reduction targets, and which are bankable and tradeable across facilities; and (3) offset credits earned by a facility for an activity that reduces or sequesters GHG emissions in accordance with regulations developed under the *MGGA*.[101] However, as of 1 March 2022, no regulations have been developed to allow for the generation of offset credits in Newfoundland and Labrador.

IV. 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: (1) wholly or partially

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95 SNL 2016, c M-1.001 [*MGGA*].
96 NLR 116/18 [*MGGR*].
97 *MGGA*, *supra* note 95, ss 2(h), 5; *MGGR*, *ibid*, s 8.
98 *MGGR*, *ibid*, ss 3, 8(1).
99 *MGGA*, *supra* note 95, s 5.1.
100 *Ibid*, ss 2(e), (g), (l), (n); *MGGR*, *supra* note 96, s 9.
101 *MGGA*, *ibid*, ss 2(e), (g), (l), (n); *MGGR*, *ibid*, ss 10–12; see also Government of Newfoundland and Labrador, News Release, "Provincial Government Releases Federally-Approved Made-in-Newfoundland and Labrador Approach to Carbon Pricing" (23 October 2018), online: <gov.nl.ca/releases/2018/mae/1023n01/>.

meeting internal carbon reduction commitments; (2) achieving other environmental, social and governance (ESG) targets; (3) meeting contractual requirements with their customers; (4) responding to investor and public climate change and air quality concerns; and (5) offsetting their emitting 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 toward 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),[102] the Oil Sands Pathways Alliance initiative (which includes Canadian Natural Resources, Cenovus Energy, ConocoPhillips, Imperial, MEG Energy, and Suncor Energy),[103] numerous large public organizations (including Air Canada,[104] Stantec,[105] and TELUS),[106] and educational institutions (including Concordia University,[107] Université de Montreal,[108] and the University of Toronto).[109] 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

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

103 Pathways Alliance, "Key Oil Sands Groups Join Forces Under Pathways Alliance Banner" (15 June 2022), online: <pathwaysalliance.ca/key-oil-sands-groups-join-forces-under-pathways-alliance-banner/>.

104 Air Canada, "Environment: What We're Doing…," online: <www.aircanada.com/ca/en/aco/home/about/corporate-responsibility/environment.html#/>.

105 Brendan Player & Jeff Tabar, "Capturing Carbon: How Nature-Based Solutions Help Achieve Net Zero Goals" (4 October 2021), online: <stantec.com/en/ideas/topic/climate-change/capturing-carbon-why-nature-based-solutions-are-the-tool-of-choice-to-achieve-net-zero-goals>.

106 Telus Ventures, "Radicle Announces Investment by TELUS Ventures to Accelerate Growth: Canada's Largest Developer of Compliance-Grade Carbon Credits Targets Global Expansion," online: *Telus Ventures* <telus.com/en/ventures/news/radicle>.

107 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-road map-towards-carbon-neutrality.html>.

108 Université de Montréal, "Paiement de crédits carbone à même les subventions de recherche" (27 November 2019), online: <recherche.umontreal.ca/en/actualites-secteurs-sante-sciences-societe-et-culture/nouvelle/news/detail/News/paiement-de-credits-carbone-a-meme-les-subventions-de-recherche/>.

109 University of Toronto, "Transforming Our Campus: Towards a Low-Carbon Future at U of T St. George," online: <www.fs.utoronto.ca/sustainability/transforming-our-campus/>.

of US$15 per $MtCO_2e$ for afforestation and reforestation projects.[110] Conversely, technology-based carbon removal projects such as carbon capture and storage projects have garnered as much as US$300 per $MtCO_2e$.[111]

B. PROCESS FOR TRADING IN VOLUNTARY CARBON CREDITS

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

(1) 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 (for example, ISO 14067:2018(en)).[112] 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.

(2) 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.

(3) 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 in validating and verifying carbon credits generated with specific sectoral scopes, meaning its expertise is geared toward the types of projects it audits.[113]

(4) 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.

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110 Silvia Favasuli & Vandana Sebastian, "Voluntary Carbon Markets: How They Work, How They're Priced and Who's Involved" (10 June 2021), online (blog): *S&P Global Commodity Insights* <spglobal.com/commodity-insights/en/market-insights/blogs/energy-transition/061021-voluntary-carbon-markets-pricing-participants-trading-corsia-credits>.

111 *Ibid.*

112 ISO, Online Browsing Platform (OBP), "ISO 14067:2018(en) Greenhouse Gases – Carbon Footprint of Products – Requirements and Guidelines for Quantification," online: <iso.org/obp/ui/#iso:std:iso:14067:ed-1:v1:en>; see also Carbon Offset Guide, "Clean Development Mechanism (CDM)," online: <offsetguide.org/understanding-carbon-offsets/carbon-offset-programs/united-nations-offset-mechanisms/clean-development-mechanism-cdm/>.

113 See *TIER, supra* note 40, ss 27(1)–(6) (These independent auditors are akin to third party assurance providers under Alberta's *TIER* offset regime).

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

(6) 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 percent) of all voluntary carbon credits certified and available for purchase are generated and managed by one of four standards:[114] (1) Verified Carbon Standard (VCS), representing approximately 50 percent of all contracted voluntary carbon credits;[115] (2) Climate Action Reserve (CAR); (3) Gold Standard; and (4) 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 percent from 2020's high-water mark.[116] The estimated market for carbon credits could be worth upward of US$50 billion by 2030.[117] In 2021, participants traded over US$1 billion in voluntary carbon credits, with an estimated weighted average price of US$3.37 per $MtCO_2e$.[118]

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

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114 Carbon Offset Guide, "Voluntary Offset Programs," online: <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: *The Global Carbon Project* <www.globalcarbonproject.org/global/pdf/WWF_2008_A%20comparison%20of%20C%20offset%20Standards.pdf>.

115 Verra, "Verified Carbon Standard: The World's Leading Voluntary GHG Program," online: <verra.org/project/vcs-program/>.

116 Stephen Donofrio et al, "Markets in Motion: State of the Voluntary Carbon Markets 2021" (15 September 2021) at 4, online: *Ecosystem Marketplace* <forest-trends.org/publications/state-of-the-voluntary-carbon-markets-2021/>.

117 See generally Christopher Blaufelder et al, "A Blueprint for Scaling Voluntary Carbon Markets to Meet the Climate Challenge" (January 2021), online: *McKinsey & Company* <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).

118 The EM Insights Team, "Voluntary Carbon Markets Top $1 Billion in 2021 with Newly Reported Trades: A Special Ecosystem Marketplace COP26 Bulletin" (10 November 2021), online: <ecosystemmarketplace.com/articles/voluntary-carbon-markets-top-1-billion-in-2021-with-newly-reported-trades-special-ecosystem-marketplace-cop26-bulletin/>.

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 $MtCO_2e$.[119]

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.[120] Approximately half of all VCUs issued on the Verra Registry are issued under agriculture, forestry, and other land use protocols.[121]

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).[122]

The Verra Registry also provides for VCUs to be labelled with certifications awarded by other, non-GHG programs that have been approved by VCS (such as 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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119 Climate Focus, "The Voluntary Carbon Market Dashboard" at 6, online: <app.powerbi.com/view?pageName=ReportSection68c2510fa4171bdf82a9&r=eyJrIjoiNGI5ZDY1ZWUtZGU0NS00MWRmLWFkNjQtMTUyYTMxMTVjYWQyIiwidCI6IjUzYTRjNzZkLWI2MjUtNGFhNi1hMTAzLWQ0M2MyYzIxYTMxMiIsImMiOjl9>.

120 Verra, "Catalog of Approved Methodologies, Modules & Tools," online: <verra.org/project/vcs-program/methodologies/methodology-catalog/>; see also Verra, "VCS Sectoral Scopes," online: <verra.org/project/vcs-program/projects-and-jnr-programs/vcs-sectoral-scopes>.

121 Verra, "Agriculture and Forestry Projects," online: <verra.org/project/vcs-program/projects-and-jnr-programs/agriculture-and-forestry-projects/>.

122 Verra, "Verified Carbon Units (VCUs)," online : <verra.org/project/vcs-program/verified-carbon-units-vcus/>; see also Verified Carbon Standard, "Double Counting: Clarification of Rules" (1 February 2012), online: <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.[123]

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.[124]

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 becoming eligible 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.

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 $MtCO_2e$.[125]

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. The American Carbon Registry is an approved offset project registry for tradeable credits in California's cap-and-trade compliance market, but also maintains a public voluntary registry

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123 Climate Action Reserve, "About Us," online: <climateactionreserve.org/about-us/>.
124 Gold Standard, "Vision + Impacts," online: <goldstandard.org/about-us/vision-and-mission>.
125 Gold Standard, "Carbon Pricing: What Is a Carbon Credit Worth?," online: <goldstandard.org/blog-item/carbon-pricing-what-carbon-credit-worth>.

for carbon credits generated in the United States and elsewhere in accordance with its approved protocols, which are sold as Emission Reduction Tons (ERTs).[126]

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 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.[127]

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, Quebec, and Nova Scotia.[128] Another example is CSA Group, which offers training in GHG accounting, quantification and verification training, and certification. It also maintains and administers independent, transparent registries on behalf of private and governmental organizations managing carbon emissions.[129] 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.[130]

E. RENEWABLE ENERGY CREDITS AND CLEAN ENERGY CREDITS

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 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 (for example, 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.[131] Compliance RECs trade at much higher prices than voluntary RECs, likely because compliance RECs must be

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126 American Carbon Registry, "American Carbon Registry: Harnessing the Power of Markets to Improve the Environment," online: <americancarbonregistry.org/>.

127 American Carbon Registry, "How it Works: What We Do," online: <americancarbonregistry.org/how-it-works/what-we-do>.

128 Western Climate Initiative, Inc, "Our Work: Program Design and Implementation," online: <wci-inc.org/our-work/program-design-and-implementation>.

129 CSA Group, "ISO 14064-1:2018 Greenhouse Gas Inventories & Measuring Carbon Footprint," online: <csagroup.org/store/product/50072450os/>.

130 Government of Alberta, "Alberta Emission Offset System," online: <alberta.ca/alberta-emission-offset-system.aspx>.

131 US, New York State Energy Research and Development Authority, *Market-Based Environmental Protection Mechanisms and the Impact on Energy Production and Use: Final Report* (no 11-31) (October 2011) at 18–21, online: <nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Research/Environmental/EMEP/Market-Based-Environmental-Protection-Mechanisms.pdf>. See also US, Environmental Protection Agency, *Clean Energy Finance: Using Renewable Energy Certificates to Achieve Local Environmental Goals* (April 2021) at 6, online: <www.epa.gov/sites/default/files/2021-04/documents/usepa_renewableenergycertificates_april_2021.pdf>.

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 REC 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 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.[132]

Currently in Canada the two main REC certification programs are the: (1) EcoLogo Program;[133] and (2) Green-e Program.[134] 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 recognized International Organization for Standardization's (ISO) quality management standards. For instance, ISO 14067:2018(en) focuses on requirements and guidelines for quantifying the carbon footprint of products.[135]

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: (1) energy production and

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132 RE100 Climate Group and CDP, "RE100 Technical Criteria" (22 March 2021), online: *RE100* <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).

133 UL Solutions, "Ecologo® Certification Program," 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).

134 Green-e, "Green-e® Energy," 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: (1) 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); (2) the Green-e Energy Code of Conduct for Canada and the United States (v.2.3); and (3) the CRS Listed Tracking Attestation).

135 ISO, *supra* note 112.

distribution; (2) waste handling and disposal; and (3) 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.[136]

Unlike most jurisdictions with regulated compliance carbon credit regimes, which require credits to be generated within 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, 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.[137] 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 percent of their compliance obligation,[138] and the market value of carbon offsets is capped, which serves 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

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136 See e.g. *TIER*, *supra* note 40.

137 See Verra, "Verified Carbon Standard: Program Guide, v 4.1" (20 January 2022), online: <verra.org/wp-content/uploads/2022/01/VCS-Program-Guide_v4.1.pdf> (for example, section 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).

138 *TIER*, *supra* note 40, s 13(9).

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.[139]

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

V. 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 percent of the total excess emissions that facilities were required to offset with either Fund credits, EPCs, or emission offsets.[140] *TIER*-regulated facilities used emission offsets and performance credits to account for approximately 30 percent and 15 percent, respectively, of their total excess emissions over the same period.[141] 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

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

140 Alberta, *Specified Gas Emitters Regulation and Carbon Competitiveness Incentive Regulation Results*" (Edmonton: Alberta Environment and Parks, 2020), online: <open.alberta.ca/dataset/specified-gas-emitters-regulation-and-carbon-competitiveness-incentive-regulation-results> [Alberta, *SGER and CCIR Results*]; see also Graham Harris, "Compliance Routes in Alberta's Carbon Markets: A Look at Past Trends and Future Possibilities" (30 April 2021), online: *Firefly GHG Consulting* <fireflyghg.eco/post/an-animated-look-at-compliance-routes-in-alberta-s-carbon-market>.

141 Alberta, *SGER and CCIR Results*, *ibid*.

compliance options. However, offset use in Alberta's compliance market increased significantly after 2016,[142] especially offsets from wind electricity generation, tillage management, and carbon capture and storage.[143]

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.[144] 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 tenfold.[145] Despite this growth, however, voluntary markets still represent a small fraction — less than 1 percent — of global GHG emissions.[146]

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, 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 Part III, 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 (such as 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,[147] 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 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

142 *Ibid*.

143 See Graham Harris, "Where Have Alberta's Emission Offsets Come From? (A Bar Chart Race)" (13 October 2020), online: *Firefly GHG Consulting* <fireflyghg.eco/post/where-have-alberta-s-emission-offsets-come-from-a-bar-chart-race>.

144 Turner et al, *supra* note 139 at 7–8.

145 Climate Focus, *supra* note 119 (retirement data and non-retired volumes).

146 Turner et al, *supra* note 139 at 2.

147 *OBPS Regulations*, *supra* note 10, ss 78(1)–(3) (these are currently limited to two British Columbia protocols and a handful of Alberta protocols); see Environment and Climate Change Canada, "List of Recognized Offset Programs and Protocols for the Federal OBPS," 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 40, s 22(5).

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 Part IV, 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 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.[148]

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 the 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. Most transactions in carbon credits and RECs 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.[149] However, if the underlying commodity is uniform and fully fungible, increased platform or exchanged-based transactions would be expected. This would raise different securities regulatory questions; for instance, whether the underlying contract might constitute an "exchange contract" for purposes of the *Securities Act* (Alberta)[150] or a "futures contract" under the *Commodity Futures Act* (Ontario).[151]

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148 Patricia Pinter & Kanchan Yadav, "Reckoning with Renewables: Appetite for I-RECs Grows Amid Tightening of Carbon Credit Rules" (1 March 2022), online: *S&P Global Commodity Insights* <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>.

149 See *Derivatives: Product Determination*, ASC MI 91-101 (30 September 2016), online: <asc.ca/-/media/ASC-Documents-part-1/Regulatory-Instruments/2018/10/5315595--91-101-MI-Consolidation-Eff-Sept-30-2016.ashx> (same for all other jurisdictions except Ontario, this exemption resides in section 2(1)(d) of Multilateral Instrument 91-101); but see *Derivatives: Product Determination*, OSC, Rule 91-506 (30 April 2015), online: <osc.ca/sites/default/files/pdfs/irps/rule_20150727_91-506_unofficial-consolidation-derivatives.pdf> (section 2(1)(d) contains an equivalent exemption applicable only to Ontario).

150 RSA 2000, c S-4.

151 RSO 1990, c C.20.

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 Part 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 prescribed cost of a Fund credit.[152] 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 (for example, nature-based solutions) are driving such credits to "unsustainably low" prices.[153] 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.[154] 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.[155]

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 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.

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152 See e.g. Katie Sullivan, Ellen Lourie & Chelsea Bryant, "Carbon Market Business Brief: Alberta" at 2–3, online: <ieta.org/resources/Resources/CarbonMarketBusinessBrief/CarbonMarketBusinessBrief Alberta2020.pdf>.

153 Turner et al, *supra* note 139 at 45.

154 *Ibid*.

155 Climate Focus, *supra* note 119 (retirement data and non-retired volumes).

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 Supreme Court of Canada'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.[156] 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.

The federal government acknowledged this price uncertainty concern in its *2030 Emissions Reduction Plan*.[157] 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.[158]

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 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.

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156 ECCC, "2023-2030 Update to the Pan-Canadian Approach," *supra* note 18.

157 See Environment and Climate Change Canada, *2030 Emissions Reduction Plan: Canada's Next Steps to Clean Air and a Strong Economy*, Catalogue No En4-460/2022E-PDF (Gatineau: Environment and Climate Change Canada, 2 June 2022) at 27, online: <www.canada.ca/content/dam/eccc/documents/pdf/climate-change/erp/Canada-2030-Emissions-Reduction-Plan-eng.pdf>.

158 *Ibid*.

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.[159]

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.[160]

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,[161] meaning that, for example, if a project is developed in reliance on the current emissions reduction requirements and offset protocols under the *TIER* (for example, 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 Part III 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

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159 *TIER*, *supra* note 40, s 22(5).
160 *Cap and Trade Cancellation Act, 2018*, SO 2018, c 13.
161 *TIER*, *supra* note 40, s 22(7).

quantification protocol will be developed to allow for the recognition of offset credits.[162] ECCC also conducts periodic reviews of existing federal offset protocols, and where the protocol is deemed to no longer be additional, it may be withdrawn.[163] 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" (such as its rate of uptake in a given sector) exceeds 40 percent, it will no longer be additional.[164] British Columbia's Offset Protocol Policy 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.[165]

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 31 December 2021, at which time it was withdrawn because it was deemed to no longer be additional.[166]

The federal government's launch of consultations on a federal Clean Electricity Standard (CES)[167] 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.[168] 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.[169] 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"[170] by 2035 while

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162 Environment and Climate Change Canada, *Carbon Pollution Pricing: Considerations for Protocol Development in the Federal GHG Offset System*, Catalogue No En4-405/2020E-PDF (Gatineau: Environment and Climate Change Canada, 2020) at 5, online: <www.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>.

163 *Ibid* at 6.

164 *Ibid* at 5–6; Alberta, *Additionality Guideline*, *supra* note 58, ss 2, 6.

165 British Columbia Ministry of Environment and Climate Change Strategy, *Offset Protocol Policy* (Victoria: Ministry of Environment and Climate Change Strategy, June 2022) at 2, 4–7, online: <www2.gov.bc.ca/assets/gov/environment/climate-change/ind/protocol/bcs_offset_protocol_policy.pdf>.

166 Alberta, *Withdrawal of the Conservation Cropping Protocol*, *supra* note 61.

167 Environment and Climate Change Canada, News Release, "Canada Launches Consultations on a Clean Electricity Standard to Achieve a Net-Zero Emissions Grid by 2035" (15 March 2022), 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>.

168 Environment and Climate Change Canada, *A Clean Electricity Standard in Support of a Net-Zero Electricity Sector: Discussion Paper* (Gatineau: Environment and Climate Change Canada, 2022) at 9, online: <www.canada.ca/content/dam/eccc/documents/pdf/cepa/CleanElectricityStandardDiscussion Paper-eng.pdf>.

169 *Ibid* at 9–10.

170 *Ibid* at 9.

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 percent penetration rate threshold.

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.[171] 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.

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[171] See for instance Western Electricity Coordinating Council, "WREGIS Operating Rules" (4 January 2021), online: <www.wecc.org/Administrative/WREGIS%20Operating%20Rules%202021-Final.pdf>. The Western Renewable Energy Generation Information System (WREGIS) is a large, web-based tracking system for RECs operated by the Western Electricity 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.

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 Part III, global trends toward 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 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 Part III.B, ECCC had two draft protocols out for public consultation in early 2022 (one has since been finalized) and is developing four other federal offset protocols.[172] As it did for the Landfill Methane Recovery and Destruction and Reducing Greenhouse Gas Emissions from Refrigeration Systems protocols, ECCC will likely soon seek public input on these four 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.[173]

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172 ECCC, "Canada's Greenhouse Gas Offset Credit System," *supra* note 25 (these are the finalized protocols for Landfill Methane Recovery and Destruction, and the protocols under development for Reducing Greenhouse Gas Emissions from Refrigeration Systems, Improved Forest Management, Enhanced Soil Organic Carbon and Livestock Feed Management, and Direct Air Carbon Capture and Sequestration).

173 *Ibid.*

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 percent uptake in a sector.

Another opportunity for improvement to compliance markets is for governments (on their own volition 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.

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.[174] 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 co-operation 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 credits issued by certain provincial programs and under approved provincial offset quantification protocols is an example of what can be done to move toward market harmonization.

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[174] See JustCarbon, "A Blockchain-Powered Marketplace that Simplifies Offsetting Carbon Emissions and Supports High-Quality Carbon Removal Projects to Combat Climate Change," online: <www.justcarbon.com/> (for example Verra credits are tradeable on this platform); Likvidi, "Bringing Carbon to Crypto," online: <www.likvidi.com> (another tradeable platform example using blockchain technology).

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.

VI. CONCLUSIONS

In this article 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.[175]

[175] See especially Katie Sullivan et al, "Carbon Market Business Brief: Canada Federal Output-Based Pricing System (OBPS)" at 3, online: <ieta.org/resources/Resources/CarbonMarketBusinessBrief/2021/CarbonMarketBusinessBrief_Canada2021.pdf>.

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