ENERGY INSIGHT - MAKING DOLLARS AND SENSE OF CARBON MARKETS - PART 3: CROSS BORDER CARBON TRANSPORTATION

Posted on August 6, 2024

Categories: Insights, Publications

In Parts 1 and 2 of this 3 part series, we looked at the background and role of carbon in the energy industry, how it is being regulated and controlled from a policy and legal perspective as well as the role and challenges CCUS plays in the carbon field.

In this Part 3, we are examining the regulation, pricing, application and transportation of carbon molecules both domestically and internationally and the challenges and issues for policy makers and industry.

PART 3: Cross-Border Carbon Transportation

In this article, we will examine the trade and transportation of physical carbon molecules in the form of CO_2. Once captured, how is carbon transported? For what purpose is it transported? What are the legalities, challenges and issues of transportation, particularly on a global scale?

There is growing interest in cross-border shipping of CO_2 for sequestration, power generation and conservation purposes. While transporting CO_2 for permanent storage is not new, in 2023 and 2024 there were a number of significant CO_2 transportation and trade agreements implemented in the European Union which involved transporting physical CO_2 molecules between jurisdictions. While the European Union is an early mover in the carbon transportation space, other jurisdictions including Canada are developing similar projects and arrangements.

Using bilateral and multilateral trade agreements, a number of European Union countries concluded deals to transport and sequester CO_2 under the North Sea as a means to achieve net zero emissions by 2050 (collectively, the "**North Sea Agreements**").[1] The trade agreements in Europe provide an early road map for the transportation and permanent storage of CO_2 and may be the start of a “carbon transportation highway.”

As governments and industry around the world seek to reduce CO_2 emissions into the atmosphere from industrial processes, industry is forging ahead to find solutions which will provide both an economic solution but also a regulatory and legal solution to global CO_2 reduction laws. Although Canada thus far is focused on local solutions, given its enormous geological advantages, it has potential to become a significant international stop on the carbon transportation highway.

Shipping physical molecules of CO_2, while technically straightforward, legally it can be challenging, particularly on an international, cross-boarder basis. As the map for a carbon transportation highway develops, it will inevitably interface with international agreements on climate change, local laws and regulations and as well as international substance transportation agreements.

In examining the state of the CO_2 transportation highway, it is useful to look at the current state of CO_2 transportation followed by an examination of selected international agreements pertaining to carbon policy and transportation of CO_2 and how certain jurisdictions are forging ahead in the absence of clear rules and regulations.

A Note on Terms

This article will focus on the transportation of physical carbon molecules in the form of CO_2 for various purposes including CCS, CCUS, and power production. For more information on the process behind capturing CO_2 for permanent storage, please see Part 1 of this series.

This article will refer to the terms "source country" and "receiving country" in relation to cross-border carbon shipping agreements. Here, "source country" will refer to countries which are the source of the CO_2, while "receiving country" will refer to the country which has agreed to provide the sequestration storage and services.

Carbon Transportation Methods

Examining methods for how CO_2 is transported provides further context for the physical logistics of what cross-border carbon transportation entails.

Transportation of CO_2 most commonly occurs in two forms: either by carrier transport, such as ship, railroad or motorcar where the CO_2 is in a liquefied state, or by pipeline, where the CO_2 is moved in either a gaseous or a "supercritical" fluid-like state.[2] When CO_2 is slowly heated and compressed, it enters a supercritical state in which the CO_2 has a density that resembles a liquid but expands to fill space like a gas.[3] Currently, CO_2 is transported in a supercritical state in North American pipelines. European countries currently are looking at moving CO_2 in a gaseous state, as less energy is required to maintain the lower pressure required to keep CO_2 in a gaseous state compared to what is needed to maintain a supercritical state.[4]

Each transportation system has benefits and drawbacks. Pipeline systems are more appropriate for transmitting large quantities of CO_2 over relatively short distances but are associated with high initial capital cost and limited versatility.[5] As such, pipelines are a best fit where there is a constant flow of CO_2.[6] Conversely, carrier transportation, particularly shipping, which is capable of traversing longer distances compared to pipelines and is associated with low capital expenditure and high flexibility, but is limited in the quantity of CO_2 that can be transported.[7] As such, there is economic viability in transportation by ship, and by extension railway and motor carrier, where there is no direct access to a suitable pipeline or where the captured quantities are insufficient to justify pipeline construction.[8] There is also a reduced cost to railway and motor carrier transport where there is pre-existing infrastructure,[9] although in historical practice railway and motor carriers have seldom been considered for CCUS projects.[10]

International Conventions Impacting Carbon Shipping

The Paris Agreement[11] contains a requirement that each signatory country agrees to a Nationally Determined Contribution ("**NDC**") for greenhouse gas ("**GHG**") emission reduction. GHG emissions, and CO_2 in particular, that are captured and sequestered as part of a CCS or CCUS process would have to be separately reported in accordance with specific guidelines from the United Nation's Intergovernmental Panel on Climate Change (the "**IPCC**"), but these captured emissions could be deducted from the total reported emissions of the source country to yield a lower level of net emissions.[12] As such, this lower level of net emissions would assist the source country in meeting its NDC.[13]

The receiving country, however, would not be able to take credit for the sequestration in meeting its own NDC, as this would constitute a "double counting" of CO_2.[14] The rationale behind this double counting rule is that while the carbon is sequestered in the receiving country, the molecules themselves were removed from the source country. As will be discussed further below, the benefit for receiving country lies, not in the ability to claim carbon credits but rather in terms of a potentially lucrative financial incentive.

In order to understand how the financial incentive works, it is necessary to examine Article 6 of the Paris Agreement, which requires cooperation among countries to achieve their NDCs.[15] To this end, Article 6 employs two mechanisms: Article 6.2 and Article 6.4. Article 6.2 outlines "cooperative approaches" and transfer of market-based mechanisms for international trading emission reduction units known as Internationally Transferred Mitigation Outcomes ("**ITMOs**"). Under Article 6.2, transfer of ITMOs may occur between different actors, including countries and private sector companies, through bilateral agreements. Article 6.4 provides a series of rules for multinational emission reduction projects.[16]

The precise rules surrounding the ITMOs are still in their infancy and there has only recently been comprehensive guidance provided by the United Nations Framework Convention on Climate Change on the accounting, reporting and review of cooperative approaches.[17] Recently, various countries have begun to agree on frameworks in order to enter into "cooperative approaches."[18] Additionally, Ghana, Switzerland and Vanuatu have recently announced the first-ever authorized Article 6.2 project, which aims to support training for rice farmers in Ghana on sustainable agricultural practices and reduction of methane emissions.[19] With that said, the Article 6 mechanisms, in particular 6.2, have historically been viewed as overly complicated, with high transaction costs and considerable uncertainty, as the applicable rules remain underdeveloped, particularly for the rapidly developing space of international carbon transportation.[20]

Despite the recent agreements noted above, governments and industry members alike have been content to operate within transactions where value is assigned to carbon through existing carbon markets rather than navigating the administrative burdens and complexities of establishing, recording and proving mitigation outcomes within the ITMO system. There is also uncertainty of how ITMOs can be functionally integrated into existing carbon markets. For a more in-depth discussion of existing carbon markets, see Part 2 of this series.

As such, the Article 6 mechanisms in their current form are unlikely to be a major factor in the growing market for transportation of CO_2.[21] Furthermore, the economics of recent carbon shipping projects are "dominated" by payments made by the source country to the receiving country providing sequestration services.[22] These payments allow the receiving country to obtain value for their sequestration services while avoiding the double counting pitfall. This mutually beneficial scenario is increasingly appetizing as countries race to construct new pathways to achieving their NDC.

This understanding of the economics of the so-called carbon highway provides further context to the various international agreements currently being struck as well as the potential benefits for Canada, specifically Alberta, given the province's extensive history with CCUS.

International Conventions Concerning Transportation of Substances

Another core consideration in cross-border shipping of carbon is the purity of the carbon stream. Carbon captured by CCS operations generally contain a low level of contaminants, but for cross-border shipping purposes this would need to be verified on a facility-by-facility basis.[23] Differing methodologies for capture as well as the source of the carbon stream can lead to variety in the composition of the carbon stream.[24] Despite available government incentives in both the US and Canada, the economics for post-combustion carbon capture from low-purity sources are not currently viable enough to generate reasonable project rates of return, necessitating a step-change in technology, policy, or both, to prompt broad industry uptake. Purity requirements for ships are likely to be more stringent than those for pipelines due to natural variations in temperature and pressure for shipping.[25]

The difference between carbon capture from high-purity and low-purity sources of CO_2 is significant in terms of efficiency and cost. High-purity sources, like those in the natural gas processing, ethanol, and ammonia/fertilizer industries are more cost-effective to capture, dehydrate, compress, transport and store the CO_2.

In contrast, capturing CO_2 from low-purity sources is more challenging. These sources have a lower concentration of CO_2, which means that the processes involved in capturing, concentrating, and storing become more complex, energy-intensive, and expensive. For example, capturing CO_2 from a gas with a higher concentration is easier because more CO_2 molecules are flowing past the scrubbers, making the process more efficient.[26] However, as the concentration of CO_2 decreases, the energy required for separation increases, leading to higher costs.[27]

Currently there are no international environmental treaties which explicitly seek to regulate the cross-border transportation of CO_2. However, the recent North Sea Agreements, which will be discussed in more detail below, provide an insight into how international regulation may occur. In particular, the North Sea Agreements explicitly considered and incorporated the potential application of the London Protocol.[28]

London Protocol

The London Protocol is an international convention which regulates marine dumping of waste and other substances, as they are sequestering carbon under the seabed.

As the London Protocol concerns the ocean transportation of waste as well as marine pollution and dumping, it has implications for cross-border CO_2 transportation. Note that the legal framework of the London Protocol only applies to carbon transportation if it is dumped offshore. The London Protocol does not regulate carbon capture process or onshore carbon storage. However, a country hoping to sequester carbon underwater would find itself having to navigate the London Protocol, as is currently the case for European countries turning their eyes to the depilated oil reserves under the North Sea.

The London Protocol does not define "export"; however, it defines "waste and other matter" as a "material and substance of any kind, form or description" and defines "dumping as "any storage of wastes and other matter in the seabed and subsoil thereof from vessels, aircraft, platforms or other man-made structures at sea."[29] Sequestration in the North Sea specifically requires navigation of the London Protocol because storing the carbon underwater is caught up in the definition of dumping. Conversely, export for onshore storage or its transportation for Enhanced Oil Recovery ("**EOR**") is not prohibited under the London Protocol, because neither activity falls within the definition of dumping, which is solely concerned with marine activity.[30]

Additionally, the 2009 amendment to the London Protocol (the "**2009 Amendment**") authorizes the cross-border export of CO_2 for geological storage.[31] Under the 2009 Amendment, marine sequestration is no longer prohibited under the definition of dumping. Note that the 2009 amendment does not directly regulate acts of transportation, and it specifically does not establish detailed rules for handling of CO_2 or how it must be transported.

However, one particular wrinkle to the 2009 Amendment is that it has not yet met the requirements of two-thirds of the parties to the London Protocol ratifying the agreement.[32] However, in 2019, Norway and the Netherlands proposed a resolution which would authorize the export of CO_2 for geological offshore storage.[33] This interim solution enables two or more countries to apply the 2009 export amendment before it enters into force, thus allowing countries to consent to cross-border transport of CO_2 without breaching international commitments.[34]

Beyond that, there is something of an international vacuum regarding these developing international CO_2 highways. Consequently, the regulation of carbon shipping and sequestration falls back on both international agreements entered into between source and receiving countries as well as any domestic regulations and policies within a source country involving the sequestration of carbon.

It is notable that in Canada, Environmental and Climate Change Canada ("**ECCC**") has implemented the London Protocol to meet its obligations through the Canadian Environmental Protection Act. The ECCC reports to the London Protocol at annual meetings. As such, analyzing how the London Protocol has impacted the formation of the North Sea Agreements can inform how Canada may be impacted should it engage in offshore sequestration.

Recent International Agreements Concerning CO_2 Transportation

The EU's North Sea

The issue of cross-border shipping in CO_2 sequestration requires consideration of both international and domestic laws as well as international and domestic carbon reduction targets. As noted above, it is source countries, not receiving countries, who receive emissions reduction credit for the sequestering of CO_2.

In particular, European countries that are located around the North Sea are working to accelerate and streamline widespread deployment of CO_2 transportation and sequestration infrastructure through bilateral agreements. The following North Sea agreement projects are particularly noteworthy:

- **Project Greensand**, the first venture to achieve cross-border carbon capture and storage through the shipping of liquefied CO_2 from Belgium for sequestration by way of injection into depleted oil fields under the Danish North Sea.[35] On March 8, 2023, Project Greensand initiated the world's first cross-border offshore CO_2 storage intended to mitigate climate change.[36] Project Greensand aims to store up to 1.5 million tonnes of CO_2 by 2026.[37] By 2030, Project Greensand aims to store up to 8 million tonnes of CO_2 per year.[38]

- The **bilateral agreement** signed on March 4, 2024 between France and Denmark on March 4, 2024, enabling sequestration in Denmark.[39] The transport project will initially be by ship before eventually transporting the CO_2 from France via a branch of the *Dartagan carboduc* (carbon pipeline) developed by French gas transporter GRTgaz.[40] This agreement is intended to help France meet its domestic carbon reduction target of storing more than 8 million tonnes of carbon by 2030 and 20 million tonnes by 2050.[41] The total EU target is to store 50 million tonnes of CO_2 by 2030.[42]
- **Bilateral agreements** signed between Norway, Belgium, Denmark, the Netherlands and Sweden from 2022 through 2024, enabling sequestration in Norway.[43] The Government of the Netherlands has stated that these Memorandums of Understanding, finalized April 15, 2024, will "remove obstacles on the way to a well-functioning carbon capture and storage-market in the North Sea region."[44]

The North Sea Agreements seek to take advantage of the unique geology of the region, which is not only ideal for sequestration, but expansive as well. For reference, if Norway offered sequestration in an amount which was equivalent to the CO_2 produced from the combustion of all Norwegian oil and gas export in 2022 (around 400 million tons of CO_2), the Norwegian North Sea would still be well below its estimated 70 Gt sequestration potential.[45]

As a general rule, these agreements encourage sharing of best practices and technologies. Although still novel, it is possible that as bilateral and multilateral agreements similar to the ones discussed above become increasingly common that they could come to set a standard for cross-border carbon transportation. Bilateral and multilateral agreements such as these are notable as they can streamline cross-border transport to storage sites through a large European cross-border transportation network, irrespective of geographic boundaries and irrespective of "source country" / "receiving country" issues. It is notable, however, that the North Sea Agreements, while interjurisdictional from a country perspective, are uni-jurisdictional from a carbon management perspective, as the agreements fall within one carbon regulated jurisdiction, i.e. the European Union.[46]

The United States

Currently, there are 15 carbon sequestration facilities operating in the United States.[47] An additional 121 facilities are currently under construction or in development. If all facilities were completed, they would increase the United States' sequestration capacity to 3 percent of the nation's current annual CO_2 emissions.[48] The bulk of the American facilities currently in operation are located on or near the southwest coast of the Gulf of Mexico.[49]

At present, carbon sequestration in the United stated remains limited to industrial processes, particularly those in which the cost to capture CO_2 is low, such as processing natural gas, producing ammonia for fertilizer, and producing ethanol for vehicle fuel and other uses.[50]

As noted in Part 1 and Part 2 of this series, the United States is seeking to position itself to attract the full value chain of carbon markets (including carbon credits, CCUS and transportation). However, the tax benefits provided by the Internal Revenue Code for CCS and the subsidies provided to CCS by the Infrastructure Investment and Jobs Act of 2021 have been criticized as being "not consequential for projects involving cross-border transportation of CO_2."[51] Additionally, the tax benefits for CCS provided by the Inflation Reduction Act of 2022 apply only to carbon dioxide captured and stored in the United States and therefore would have no benefits for the international transportation market.[52]

An additional consideration in the field of bilateral and multilateral agreements between source and receiving countries are agreements concerning the import and export of hazardous waste. While hazardous waste, per se, is not currently applicable to CO_2 transportation, due to the discussions of purity levels of CO_2, it is possible that CO_2 transportation across boarders may become regulated by other international agreements such as hazardous waste agreements, as noted above with the North Sea agreements' consideration of the London Protocol.

Canada's Potential as a Receiving Country

With the growing interest in cross-border CO_2 transportation, Canada is uniquely positioned as a potential receiving country. First and foremost, Canada is well suited to provide vast storage reserves due to its geology. Canada is rich in on-shore and off-shore sedimentary basins suitable for CO_2 storage. Of particular consideration for carbon sequestration is the Williston Basin, which is located primarily in southern Saskatchewan, as well as the Western Canadian Sedimentary Basin ("**WCSB**"), which spans British Columbia to Manitoba. To emphasize the expansiveness of the WCSB, the geological formations in the BC portion alone could store an estimated 4.2 Gt of CO_2, which amounts to more than 66 years of the province of British Columbia's emissions.[53]

In addition to full commercial-scale carbon sequestration projects in operation, Canada has world-class research and testing facilities in British Columbia, Alberta, Saskatchewan, Ontario, and Québec to develop and scale up carbon management technologies.[54] Canada is notably a global leader in the testing concepts and pilot technologies for this specialized infrastructure.[55]

Canada also has several policies and regulatory measures which provide a measure of legal certainty in the otherwise un-regulated world of cross-border carbon trade. In 2021, Canada committed to spending 319 million CAD over seven years on CCUS.[56] Additionally, there are several enabling regulatory policies for CCS and CCUS projects in Canada, including the Canada Growth Fund, Canada's Carbon Management Strategy, Research, Design and Development support under NRCan's Energy Innovation Program and the CCUS Investment Tax Credit ("**ITC**"). Furthermore, there are several extensive regulatory schemes which are directly pertinent for CCUS and CCS initiatives in Canada, such as the Canadian Energy Regulator ("**CER**") and onshore pipeline regulations.[57] In the case of transboundary CCUS potential, the CER has jurisdiction over interprovincial and international commodity pipelines and is experienced in regulating CO_2 pipelines.

Additionally, note that in Canada, provinces own their own subsurface resources.[58] Included among these subsurface resources are the "pore space" underground where carbon would be stored, thus leaving provinces primarily responsible for regulating CCUS activities.[59] Alberta, Saskatchewan, and British Columbia all have regulations in place to support safe and permanent geological CO_2 storage.[60] These regulations cover pore space tenure acquisition, project permitting, management of long-term liability for CO_2 storage, as well as measurement, monitoring, and verification requirements.[61]

Alberta

Among Canadian provinces, Alberta is particularly noteworthy in terms of its carbon sequestration history and potential. Alberta is at the forefront of CCUS implementation in Canada.[62] The Alberta government has invested over $1.24 billion for up to 15 years in the Quest and Alberta Carbon Trunk Line ("**ACTL**") projects, which are discussed in further detail in Part 1 of this series.[63] Since 2015, the Quest and ACTL projects have safely captured and stored a total of more than 11.5 million tonnes of CO_2.[64]

In addition to the Canadian policies related to carbon sequestration noted above, the Alberta Carbon Capture Inventive Program is targeted at supporting hard-to-abate industries, such as oil and gas, power generation, hydrogen, petrochemicals and cement, in the reduction of their emissions through integration of CCUS into their operations.[65]

Due to its longstanding history with CCUS initiatives, Alberta offers regulatory certainty. In Alberta, the AER regulates both CCS and CCUS projects.[66] However, it is worth noting that obtaining permits can be challenging. For instance, the Pathways Alliance has been trying for over three years to obtain the necessary permits for their project, indicating that there are more complexities at play than just the AER's involvement. Additional regulations of consideration in Alberta include:

- The Carbon Sequestration Tenure Regulation, which enables the Government of Alberta to issue evaluation permits, agreements, and leases for carbon sequestration in Alberta.[67] Tenure rights for storing CO_2 are issued by Alberta Energy and Minerals under the Carbon Sequestration Tenure Regulation.[68]
- The *Oil and Gas Conservation Act* ("**OGCA**"), which permits the AER to approve CO_2 schemes if CO_2 injection will not interfere with i) the recovery or conservation of oil and gas, or ii) an existing use of the underground formation for storing oil and gas.[69]

· The *Public Lands Act, Surface Rights Act*, and the OGCA, all of which manage surface rights for CO_2 sequestration and CO_2 EOR.[70]

Conclusion

The transportation of CO_2 is emerging as a critical component in meeting international emissions targets. This bulletin has highlighted the growing interest and rapid developments in cross-border CO_2 transportation, driven by the urgent need to address CO_2 emissions reduction legislation. Industry is moving swiftly, often outpacing policymakers and regulators, as evidenced by the numerous recent agreements, such as the North Sea Agreement and various EU accords.

Despite this momentum, the regulatory landscape for CO_2 transport remains fragmented and underdeveloped. International treaties and regulations either do not exist or fail to adequately address the complexities of CO_2 transportation. This regulatory gap creates uncertainty and potential barriers to the growth of this vital industry.

Compounding these challenges are some concerning regulatory trends that could impede progress. For instance, there is a risk of CO_2 being classified as hazardous waste, which would significantly complicate its transport and storage. Additionally, the potential regulation of CO_2 purity levels poses a paradox, as capturing and sequestering impure CO_2 should be highly desirable from an environmental perspective, yet current regulatory approaches do not reflect this goal.

In summary, while the drive to transport CO_2 across borders is fueled by the necessity to meet emissions targets, the industry faces significant hurdles due to lagging regulatory frameworks and emerging policy challenges. Addressing these issues will be crucial to unlocking the full potential of CO_2 transportation as a key strategy in global carbon management efforts.

Your Strategic Partner in Carbon Markets

McMillan LLP is dedicated to helping clients navigate the complexities of the rapidly evolving carbon market landscape. We provide expert legal guidance and strategic advice to ensure the successful development and implementation of CCUS projects.

Our legal teams are skilled at structuring and closing complex transactions in Canadian, US and international markets, and providing innovative transactional advice and solutions. Our understanding of business imperatives and our relationships with the regulators helps us deliver unmatched value to our clients.

Contact us to learn how we can support your carbon transportation initiatives and help you capitalize on opportunities within the carbon market. Together, we can contribute to achieving a net-zero economy.

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[2] "Legal Issues in Oceanic Transport of Carbon Dioxide for Sequestration" by Carolina Arlota, Michael B. Gerrard et al. (columbia.edu) [the Sabin Report] at 33.
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[4] Marvin T White et al, "Review of supercritical CO_2 technologies and systems for power generation" (2021) 185 Applied Thermal Engineering 1 at 2-15.
[5] Hisham Al Baroudi et al, "A review of large-scale CO_2 shipping and marine emissions management for carbon capture, utilisation and storage" (2021) 287 Applied Energy 1 at 2.
[6] *Ibid* at 2.
[7] *Ibid* at 2.
[8] *Ibid* at 3.
[9] Alina Ho, "The right track: Advancing CO_2 transport by rail" (2024) Kleinman Center for Energy Policy.
[10] Baroudi, supra note 5 at 3.
[11] *Paris Agreement, being an Annex to the Report of the Conference of the parties on its twenty-first session, held in parties from 30 November to 13 December 2015–Addendum Part two: Action taken by the Conference of the parties at its twenty-first session*, 12 December 2015, UN Doc FCCC/CP/2015/10/Add.1, 55 ILM 740 ["Paris Agreement"].
[12] The Sabine Report, *supra* note 2 at 128.
[13] *Ibid* at 128.
[14] *Ibid* at 120.
[15] Paris Agreement, *supra* note 11 at Articles 6.2 and 6.4.
[16] *Ibid* at Articles 6.2 and 6.4.
[17] *Article 6.2: Manual for the accounting, reporting and review of cooperative approaches*, 30 November

2023, UN Doc 634353.
[18] The following is a non-exhaustive list of such agreements: Switzerland has agreed to purchase ITMOs from countries including Ghana, Peru, Senegal, the Dominican Republic, Thailand, Ukraine, Malawi, Chile, Uruguay, Georgia and Vanuatu; Sweden has agreed to acquire ITMOs from Ghana and is collaborating with the Global Green Growth Institute to transact ITMOs with Nepal and Cambodia: South Korea and Vietnam have entered into bilateral agreements to transfer ITMOs.
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[21] *Ibid* at 130.
[22] *Ibid* at 130.
[23] *Ibid* at 33.
[24] *Ibid* at 27.
[25] *Ibid* at 69.
[26] MIT Climate Portal, "How efficient is carbon capture and storage?" (23 February, 2021).
[27] Belfer Center for Science and International Affairs, "Carbon capture, utilization, and storage: Technologies and costs in the U.S. context" (January 2022).
[28] *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter*, Nov 7, 1996 (entered into force Mar 24, 2006), 36 ILM 7 [the London Protocol].
[29] *Ibid* at Article 1 for the definitions of "dumping" and "waste and other matter".
[30] *Ibid* at Article 1(4)(3).
[31] *Ibid* at Article 6.
[32] See the London Protocol, supra note 28 at Article 21 for the two-third requirement for amendments to the London Protocol's text entering into force.
[33] The Sabin Report, *supra* note 2 at 56-57.
[34] *Ibid* at 57.
[35] Euractiv, "Denmark inaugurates world's first cross-border CO_2 storage site" (8 March, 2023).
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[46] Aker Carbon Capture, *supra* note 1.
[47] US, Congressional Budget Office, "Carbon capture and storage in the United States" at Chapter 3, Table 1.1.
[48] *Ibid* at Chapter 1.
[49] *Ibid* at Chapter 1.
[50] *Ibid* at Chapter 1, Figure 1-2.
[51] The Sabin Report, *supra* note 2 at 4.
[52] *Ibid* at 4.
[53] Natural Resources Canada, "Canada's carbon management strategy" (last modified 13 December, 2023).
[54] *Ibid*.
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[57] Natural Resources Canada, *supra* note 53 at Annex B.
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[59] *Ibid*.
[60] *Ibid*.
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[62] Carbon Capture Utilization and Storage: A Canadian Media: "Provincial strategies for implementing CCUS in Canada" (accessed 30 July, 2024).
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[64] *Ibid*.
[65] Government of Alberta, "Alberta carbon capture incentive program" (accessed 30 July, 2024).
[66] Alberta Energy Regulator, "Carbon capture, utilization, and storage" (accessed 30 July, 2024).
[67] *Carbon Sequestration Tenure Regulation*, Alta Reg 68/2011.
[68] *Ibid*.
[69] *Oil and Gas Conservation Act*, RSA 2000, c O-6 [the "**OCGA**"] at s 39(1.1).
[70] *Public Lands Act*, RSA 2000, c P-40; *Surface Rights Act*, RSA 2000, c S-24; the OCGA.

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A Cautionary Note