Management and transfer of reservoir licenses & liability study

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Ashurst

OIL AND GAS CLIMATE INITIATIVE

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Executive summary

The Report provides a comprehensive analysis of the legal and regulatory frameworks governing the management, transfer, and allocation of liabilities for reservoirs used in carbon capture and storage (**CCS**) projects, with a focus on both international treaty obligations and domestic legal regimes across key jurisdictions.

The Report highlights that while international treaties such as the London Convention, UNCLOS, and the Basel Convention generally do not prohibit CCS activities, they do impose permitting and environmental protection requirements, particularly for offshore storage. Decisions under the climate change treaties, which consist of the UNFCCC, Kyoto Protocol and Paris Agreement, have been increasingly supportive of CCS as a mitigation technology, noting in particular that the COP 28 Global Stocktake decision calls for the accelerated deployment of abatement and removal technologies, including CCS. For most CCS projects, international law is unlikely to present any significant legal barriers, although effective domestic implementing policy and regulation, aligned with treaty obligations, is essential to facilitate such projects.

Across domestic legal frameworks, most jurisdictions allocate liabilities for CCS projects across three distinct phases: operational, remedial and decommissioning, and post-closure. Two principal approaches to liability allocation are observed. The first extends certain liabilities, particularly those related to remediation and decommissioning, to former licence holders, as seen in Australia, the UK, and Alberta, Canada. The second approach relieves former license holders of liability upon transfer, except in specific circumstances, as is the case in Indonesia, Malaysia, and (currently) some Australian states. There is an important interplay with the post-closure transfer of liability to the government. Most regimes require post-closure monitoring and demonstration of CO_2 stability before liability can transfer to the government, with post-closure liability periods typically ranging from 15 to 20 years, though some jurisdictions (i.e. Louisiana) require longer periods, up to 50 years.

The majority of jurisdictions analysed do not expressly consider the interplay between a production license and a CCS license over the same asset or field. This raises questions as to whether the incumbent production license holder should have priority to obtain a CCS license over the same asset or field.

The transfer of licenses is generally subject to regulatory approval, with requirements for the technical and financial capacity of transferees. Key barriers to efficient transfer include the absence of mechanisms for government assumption of long-term liability and complexity surrounding property rights (notably pore space ownership).

The comparative analysis reveals that there is no direct correlation between the comprehensiveness of a CCS regime and CCS project enablement. While more comprehensive regimes provide more certainty, this may come at the cost of CCS provisions being less investor friendly. Jurisdictions that provide for the transfer of liability to the government post-closure are more attractive to project proponents, as this enables a “clean exit” and reduces long-term risk. Conversely, regimes that impose trailing liability on former license holders increase risk and may discourage asset transfers, subject to post-closure government indemnities.

Background

1. Various legal frameworks and approaches across jurisdictions exist for managing reservoirs (and any potential associated legacy wells) which have CO_2 storage potential. This creates complexity between oil and gas operators (who may have existing rights to depleted oil and gas reservoirs), prospective CCS project developers, CCS project operators and associated industries. As the number of CCS projects continue to grow on a global scale, there is a need for project proponents in particular to understand their legal obligations, options and potential liabilities to ensure the likelihood of success throughout the full project lifecycle.

2. OGCI's CCUS Workstream has identified an opportunity to develop a greater understanding of jurisdictional differences in the management of licenses and liabilities for CCS projects utilising oil and gas reservoirs, including any associated legacy wells and other assets (i.e. platforms, pipelines, pumping stations) which could have been transferred to another organisation (whether private or public entities). The workstream is seeking to identify key issues, opportunities, and potential liabilities associated with CCS projects.

Scope of work and assumptions

3. We have been asked to provide a Report on the following:

    a. identifying and summarising existing frameworks for potential liabilities associated with the transfer of reservoirs, projects and their associated infrastructure for CO_2 storage purposes for both current and previous permit holders (not just including the last permit holder) in the selected jurisdictions, which will include:

        i. transfer liabilities that could be reasonably incurred by CCS project owners and operators and petroleum license holders related to current or future CO_2 storage operations including (but not limited to) well plug and abandonment (P&A), active wells (which may have been transferred to a different operator or transferred from production to storage), legacy wells, platforms, pipelines, pumping stations and contamination of subsurface, surface or seafloor (in both state and federal waters as required, focusing only on the risk associated with transfer of assets);

        ii. likely transfer scenarios such as:

            A. transfer from depleted oil and gas field owner or operator to CCS project owner or operator (including any intermediate transfer from oil and gas owner or operator to government and government to CCS project owner or operator); and

            B. transfer from CCS project owner or operator to government following use of the license for storage purposes and closure in accordance with applicable standards; and

        iii. an overview of the process for determining how potential liabilities are delineated between previous owners and operators, current/future storage owners and operators and governments;

        iv. an overview of potential liabilities post-closure;

v. an overview of circumstances where cause of damage cannot be clearly delineated for oil and gas assets; and

vi. any major potential barriers to transfer of reservoir licenses,

(together, the **Phase 1 Works**);

b. an overview of international laws of relevance to CCUS development, which inform the specific jurisdictional frameworks for management and transfer of liabilities as well as permitting more generally (**Phase 1A Works**); and

c. comparing existing frameworks in the selected jurisdictions, highlighting key differences and areas of commonality across jurisdictions (**Phase 2 Works**),

(collectively, the **Report**).

4. The selected jurisdictions are as follows:

a. United States of America (Illinois, California, Louisiana, New Mexico, Wyoming, Texas);

b. Brazil;

c. United Kingdom;

d. Canada (Alberta);

e. Denmark;

f. Australia;

g. Italy;

h. Korea;

i. Indonesia; and

j. Malaysia,

(collectively, the **Selected Jurisdictions**)

5. This Report considers the below items out of scope to be discussed in future phases of this study:

a. identification of technical scenarios and analysis of these scenarios;

b. identification of tax implications in respect of the analysis of these scenarios;

c. identification of principles to support the industry in implementing good practices; and

d. for Phase 1 Works, projects which are designed to utilise enhanced oil recovery and acid gas injection directly.

6. Unless otherwise stated in this Report, the information contained in this Report is accurate as at November 2025 and is provided for general information purposes only. It may not reflect subsequent changes in law, policy, market conditions, or other relevant circumstances after that date.

Phase 1A works – international law analysis: international regulations on carbon capture and storage

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Introduction

SNAPSHOT

It is important to note that, in general, only states are regulated directly under international law. Companies are regulated under domestic law, which is expected to be consistent with the law established by international law and the treaties which the relevant state has acceded to.

7. The CCS process is unique in some aspects and general in others. The unique and special aspect is that it is concerned with the gas CO_2, as the very aim of CCS is the capture, transport and sequestration of CO_2. Other aspects of the CCS process are more general and have been a feature of the oil and gas industry for much of its history. CCS requires liquefaction and pressurisation technology, pipelines, cargo ships for local or international transport, geological drilling to access reservoirs, gas injection into reservoirs and other industrial processes and components. When considering CCS activities from an international law perspective, it is useful to distinguish between how the law affects the unique and general aspects of CCS.

8. Applicable regulations may place certain requirements on the transport or storage of CO_2, specifically, for example because it is a greenhouse gas (GHG). Requirements that are specific to CO_2 may be effectuated through a treaty which does not otherwise seek to regulate any of the more general aspects of the CCS process, e.g. the fact that ships may be used for its transport or underwater drills may be used to create storage sites. The analysis presented here examines how international (treaty-based) law may have relevance to CCS, both in its general aspects and as a technology whose purpose is to sequester CO_2. The concepts and principles reflected in such international (treaty-based) law ultimately inform the development and implementation of domestic law regimes that regulate the same subject matter.

9. The analysis separates non-climate treaties from climate treaties, mainly on account of the fact that the former tend to restrain CCS (although not significantly) whereas the latter tend to encourage CCS. The situation of "states of interest" (**SOIs**) in this study – Australia, Brazil, Canada, Denmark, Indonesia, Italy, Malaysia, Republic of Korea, United Kingdom, United States – has been highlighted both in the text and in the two tables below.[1]

10. When assessing the potential liability of private (non-state) CCS operators under the treaties examined in this analysis, it should be noted that, under all treaties, states are expected (or required) to pass domestic legislation to implement the terms of the treaties. Therefore, the potential liability of private CCS operators will almost always arise indirectly under the treaties, whose direct effect is to regulate state conduct and the relations between states.

11. It follows that the potential liability of private CCS operators can be fully appreciated only from an analysis of domestic legislation in the areas indicated by the treaties (a task that is addressed below for the select jurisdictions covered in the Phase 1 Works). While each country approaches treaty implementation differently, the varying approaches are generally consistent with the requirements laid out in the treaties.

1 In the tables below addressing the Phase 1A Works, the following abbreviations are used for the SOIs cited: **AU (Australia), CA (Canada), DE (Denmark), IN (Indonesia), IT (Italy), MA (Malaysia), UK (United Kingdom), US (United States).**

Non-climate treaties

12. This part considers the relevance to CCS of non-climate treaties. The treaties are presented roughly in the order in which they were opened for signature by states. Apart from the OSPAR Convention, they are all global treaties, and apart from the HNS Convention, they are all in force.

13. A summary overview of the non-climate treaties is given in Table 1 below. As a general observation, it is noted that, apart from academic commentary, there is a distinct lack of authoritative guidance or precedent on the application (or otherwise) of these non-climate treaties to CCS activities. As such, in analysing the potential relevance of the non-climate treaties to CCS activities below, the findings and conclusions we reach are based on our view of the relevant conventions, having regard to the international law for interpreting treaties (i.e. the Vienna Convention on the Law of Treaties).

TABLE 1. Non-climate treaties with potential relevance to CCS activities. Ratification (or equivalent) status of states of interest (SOIs) is indicated.

Treaty	No. of parties	Key provisions	Relevance to CCS
London Convention: 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter	**87** All SOIs, exc. IN, MA	"Dumping" at sea, which is defined to include any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other artificial structures at sea, is prohibited or requires a permit for all types of matter. While CO_2 is not expressly caught, permitting for CO_2 disposal may need consideration. Moreover, the non- CO_2 aspects of CCS may need to be considered.	**Unlikely for CO_2:** "Dumping" does not appear to extend to sub-seabed disposal of any matter, including CO_2 (the successor 1996 London Protocol does extend dumping to CO_2).
SOLAS: 1974 International Convention for the Safety of Life at Sea	**168** All SOIs	Gases compressed, liquefied or dissolved under pressure are considered to be dangerous goods under the Convention's regulations: Chapter VII (Carriage of Dangerous Goods), Part C (Construction and Equipment of Ships Carrying Liquefied Gases in Bulk) and Regulations 11-13.	**Technical only:** Ships engaged in international voyages carrying CO_2 must comply with the requirements of the International Gas Carrier Code.

Treaty	No. of parties	Key provisions	Relevance to CCS
MARPOL: 1978 Protocol to 1973 International Convention for the Prevention of Pollution from Ships	**161** All SOIs, exc. AU, CA, IN, MA	Seeks to prevent pollution of the marine environment from "harmful substances" released from ships. The term refers to any substance which, if introduced into the sea, is liable to create hazards to human health, harm living resources and marine life, damage amenities or interfere with legitimate uses of the sea. Short of massive releases, CO_2 would not normally be harmful in this sense, but other aspects of (general) CCS may qualify.	**Unlikely for CO_2:** CCS may lead to fugitive emissions of CO_2 in the water column. The quantities are unlikely to be high enough to cause any harm to marine life or other relevant damage.
UNCLOS: 1982 United Nations Convention on the Law of the Sea	**170** All SOIs, exc. US	UNCLOS gives a result-based definition of pollution of the marine environment ("introduction … of substances … which results or is likely to result in such deleterious effects as harm to living resources", etc.), which would not normally apply to CO_2 or CO_2 storage (although it could sometimes apply in a similar way to that described above in respect of MARPOL). Moreover, CCS is unlikely to constitute "dumping" under UNCLOS. The right of coastal states to carry out sub-seabed activities in the EEZ is affirmed, subject to conditions.	**Moderate:** Storage of CO_2 in the sub-seabed is unlikely to constitute "dumping" under UNCLOS, or be otherwise prohibited. However, CCS activities could lead to pollution of the marine environment and liability for states and CCS operators.

Treaty	No. of parties	Key provisions	Relevance to CCS
Basel Convention: 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	**191** All SOIs, exc. US	The Basel Convention defines "hazardous wastes" and "other" controlled wastes in detail over five annexes. The Convention's aim is to reduce generation of hazardous waste and promote environmentally sound management of waste. It restricts the transboundary movement of hazardous waste, except where export would be environmentally sound. While CO_2 is not expressly caught by the Basel Convention's definition of waste, this may happen where the CO_2 waste stream displays particular qualities (e.g. of contaminants). It may also be relevant legally that CO_2 under pressure is hazardous even while the gas at normal pressure is not. Other elements, relating to the general CCS process, may also give rise to liability.	**Likely nil for CO_2:** CO_2 is not likely to constitute a "hazardous waste" (see Annexes I, VIII, and IX, read with Annex III), nor is it "other waste" (Annex II). Because CO_2, per se, came to be regulated for the first time through the climate treaties, which permit its emission (see below), it is unlikely to be expressly defined as a hazardous waste unless when highly pressurised. Hence, it is likely not covered by the Basel Convention.
Espoo Convention 1991 Convention on Environmental Impact Assessment in a Transboundary Context	**45** SOIs: CA, DE, IT, UK	Parties to the Convention are required to assess the environmental impacts of their transboundary activities and take appropriate and effective measures to prevent or reduce significant harm.	**High for CCS in general:** The assessment liability arises already in the early stages of planning.
Helsinki Convention: 1992 Convention on the Protection of the Marine Environment of the Baltic Sea Area	**10** SOI: DE	"Dumping" at sea (including internal waters), which is defined to include any deliberate disposal into the seabed of wastes or other matter from ships or other artificial structures at sea, is prohibited in the Baltic Sea Area, without any relevant exception for CO_2 or CCS.	**High:** The Helsinki Convention prohibits CCS in the Baltic Sea Area.
CBD: 1992 Convention on Biological Diversity	**196** All SOIs, exc. US	The Convention's key provisions on the protection of biological diversity create a framework for legislative initiative at the domestic level. In almost every domestic jurisdiction, CCS would be subject to some form of environmental impact assessment, including biodiversity impact assessment, whether it is deployed at land or at sea.	**Likely nil for CO_2, but relevant to CCS in general:** CO_2 as an element of the CCS process would not normally pose any threat of significant reduction or loss of biological diversity, but other aspects of the CCS process might do so.

Treaty	No. of parties	Key provisions	Relevance to CCS
OSPAR Convention: 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic	**15** SOIs: DE, UK	The Convention aims for more stringent protection of the marine environment of the North-East Atlantic than is provided for by other treaties the 15 states are party to. While disposal of CO_2 wastes in the sub-seabed is conditionally allowed, liability may arise for CCS if CCS causes pollution, dumping or other prohibited conduct.	**Likely nil for CO_2, but relevant to CCS in general:** CO_2 from CCS processes may be stored in sub-seabed reservoirs subject to certain conditions. Other aspects of CCS will need to be considered for possible liability.
London Protocol: 1996 Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (as amended in 2006)	**55** All SOIs exc. IN, MA	The Protocol extends the London Convention's definition of "dumping" to storage in the sub-seabed. Dumping of wastes or other matter is prohibited subject to a list of exceptions. CO_2 is among the exceptions, although subject to conditions. CCS is therefore permitted, however export of CO_2 for dumping is not. An amendment to allow for CO_2 export is not yet in force, however it may be applied provisionally, subject to conditions. Other aspects of CCS may give rise to liability for pollution by dumping under the Protocol.	**High:** A party to the Protocol may carry on CCS domestically, but it cannot export CO_2 for storage in another country unless it meets certain conditions enabling it to provisionally apply the amendment to the Protocol (as yet not in force) that seeks to end the export restriction.
HNS (not in force): 2010 International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (and Protocol)	**8 sign** SOIs: CA, DE	The Convention provides for compensation for damage caused by hazardous and noxious substances transported by sea. Liquefied gases, including CO_2, carried by ship are considered hazardous and noxious substances. Damage covers loss of life and damage to property and the environment in the territorial sea or exclusive economic zone of a state party. Damage is limited to "carriage", so that damage from CO_2 after the CO_2 has been unloaded from the ship is not covered.	**High (when/if in force):** The Convention does not restrict sea-based CO_2 transport and disposal (or CCS activities in general). Rather, it entails additional costs for CCS where CO_2 carried on board a ship in a liquefied state causes damage in state territory.

1972 – London Convention

14. The London Convention (as amended) regulates the "dumping" at sea of wastes or other matter.

15. Parties to the Convention are to prohibit the dumping of wastes or other matter of any kind at sea in whatever form or condition, subject to exceptions: Article IV of the Convention. The exceptions are defined in relation to two annexes. The dumping of wastes or other matter listed in Annex I to the Convention is

prohibited without exception. The dumping of wastes or other matter listed in Annex II requires a prior Special Permit from the relevant state authority established under the Convention. The dumping of all other wastes or matter requires a prior General Permit from the same authority.

16. Permits are to be issued by the authority only after "careful consideration" of all the factors set forth in Annex III to the Convention, including prior studies of the characteristics of the dumping site.

17. The London Convention affects states not party to the Convention insofar as the Convention controls what can be loaded onto vessels or aircraft registered in, or flying the flag of, a state party even when they are in the territory of a non-party state: Articles VI(2) and VII(1).

18. CO_2 is not expressly listed under Annex I or Annex II to the Convention. In the absence of being so listed, CO_2 "dumping" does not appear to be absolutely prohibited. Assuming this to be the case, it would not require a Special Permit. However, there has been some debate as to whether CO_2 would count as an "industrial waste" under clause 11 of Annex I,[2] noting that if the position is taken that CO_2 does count as an "industrial waste" under that provision, it would require a Special Permit for "dumping" (although whether disposal of CO_2 into the seabed is itself "dumping" within the meaning of the London Convention, see paragraphs 19 to 23 immediately below).

19. In order to determine whether CO_2 disposal via CCS would require a General Permit under the London Convention, the meaning of "dumping" must be examined.

20. Article III of the Convention defines "dumping" as any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other artificial structures at sea; or any deliberate disposal at sea of vessels, aircraft, platforms or other artificial structures at sea. "Sea" is defined as all marine waters other than the internal waters of states.

21. Although the Convention's definition of "wastes or other matter" is quite general ("material and substance of any kind, form or description"), it is reasonably clear from the above definitions that the Convention is not addressing disposal beneath the seabed (whether of CO_2 or anything else). The Convention rather means to prevent dumping in "waters".[3]

22. While CO_2 may escape from CCS operations as a fugitive emission at sea, this would be incidental to CCS operations. "Incidental" disposal of waste is excepted under the Convention.[4]

23. Therefore, a party to the London Convention carrying on CCS activities is very likely not regulated under this treaty in relation to the special aspect of CCS, namely CO_2. The position is different, however, with respect to its successor instrument, the London Protocol, which we address further in this section below.

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2 See I. Havercroft and R. Purdy, 'Carbon Capture and Storage – A Legal Perspective', 2007, available at https://cdrlaw.org/resources/carbon-capture-and-storage-a-legal-perspective/.

3 See I. Havercroft and R. Purdy, 'Carbon Capture and Storage – A Legal Perspective', 2007, available at https://cdrlaw.org/resources/carbon-capture-and-storage-a-legal-perspective/.

4 According to Article III(1)(b), "dumping" does not include the disposal at sea of wastes or other matter incidental to, or derived from the normal operations of vessels, aircraft, platforms or other artificial structures at sea and their equipment (other than wastes or other matter transported by or to vessels, aircraft, platforms, or other artificial structures at sea, operating for the purpose of disposal of such matter or derived from the treatment of such wastes or other matter on such vessels, aircraft, platforms or structures). Dumping also does not include placement of matter for a purpose other than the mere disposal of that matter, provided that such placement is not contrary to the aims of the London Convention. It should also be noted that the Convention does not cover disposal of wastes or other matter directly arising from, or related to the exploration, exploitation and associated off-shore processing of, seabed mineral resources: Article III(1)(c).

1974 – SOLAS

24. The main objective of the SOLAS Convention is to specify minimum standards for the construction, equipment and operation of ships, compatible with their safety. Flag states are responsible for ensuring that ships under their flag comply with its requirements. Various certificates are prescribed in the Convention as proof that this has been done. Control provisions allow the government of a state party to inspect ships of other state parties if there are clear grounds for believing that the ship and its equipment do not substantially comply with the requirements of the Convention ("port state control").

25. This treaty is of technical relevance to CCS, as ships carrying liquefied CO_2 must comply with the relevant provisions of the International Gas Carrier Code.[5]

1978 – MARPOL Protocol to 1973 Convention

26. The MARPOL Convention was adopted in November 1973. Five years later, with the 1973 Convention still not in force, the 1978 Protocol was opened for signature. The Protocol incorporates the parent Convention with modifications. The combined MARPOL instrument entered into force in 1983. In 1997, a further Protocol was adopted to amend the Convention and a new Annex VI was added. MARPOL has since been updated by various amendments.

27. In March 2024, the International Maritime Organization agreed to develop a work plan for establishing a framework to regulate onboard carbon capture technologies.

28. In terms of how MARPOL currently impacts CCS, the state parties to the Convention have sought to protect the marine environment from deliberate, negligent or accidental release into or on the sea of oil or other "harmful substances" from ships. To that end they agreed to several rules, which are contained in the Convention's six annexes:

    a. Annex I: Regulations for the Prevention of Pollution by Oil;

    b. Annex II: Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk;

    c. Annex III: Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form;

    d. Annex IV: Prevention of Pollution by Sewage from Ships;

    e. Annex V: Prevention of Pollution by Garbage from Ships; and

    f. Annex VI: Prevention of Air Pollution from Ships.

29. Each of these annexes contains regulations aimed at preventing or minimising pollution from ships (both accidental pollution and pollution from routine operations).

30. "Discharge" of a harmful substance occurs through any release whatsoever of a harmful substance from a ship into or on the sea, including any escape, disposal, spilling, leaking, pumping, emitting or emptying into or on the sea of a harmful substance.

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5 https://www.imo.org/en/ourwork/safety/pages/igc-code.aspx.

31. Discharge is distinguished from dumping under the earlier 1972 London Convention (see above) and does not include dumping: MARPOL Article 2(3)(b)(i). Discharge also does not include the release of a harmful substance directly arising from the exploration, exploitation and associated off-shore processing of sea-bed mineral resources.

32. "Harmful substance" is defined to mean any substance which, if introduced into or on the sea, is liable to create hazards to human health, harm living resources or marine life, damage amenities or interfere with legitimate uses of the sea: MARPOL Article 2(2).

33. As may be seen from the titles of the Convention's six annexes, CO_2 was not contemplated as a "harmful substance" falling under the control of MARPOL. CO_2 will not, in most circumstances, fit the Convention's definition of a "harmful substance". Moreover, the CCS process introduces CO_2 into the sub-seabed, not into or on the sea. CO_2 escaping as a fugitive emission during the injection process, or during storage itself, would be unlikely, except possibly in extreme circumstances, to create hazards to human health, harm living resources or marine life, damage amenities or interfere with legitimate uses of the sea.

SNAPSHOT

States negotiating treaties prior to 1990 would not have been aware of the (full extent of the) climate change nor CO_2's contribution to it. The prospect that one day CO_2 would be captured and stored in underground geological reservoirs as a mitigation strategy for climate change would simply not have occurred to them. As a result, it is not always clear how subsequent concerns and technologies, like those relating to climate change, are being affected under these treaties. Some of the earlier treaties, including the 1996 London Protocol (below), have had to be "modernised" by their state parties to deal explicitly with geosequestration or elements that did not assume significance until the late 1990s or even later.

34. Apart from CO_2, the general CCS process may potentially give rise to liability under MARPOL, for example through oil pollution or chemicals, such as amines or surfactants. Risks presented by other aspects of sea-borne CCS related to the topics of the Convention's six annexes must therefore be examined case-by-case by CCS proponents.

1982 – UNCLOS

35. UNCLOS regulates a large and disparate number of topics of state interest to do with the sea.

36. It should be noted that, while the United States has not ratified this Convention, the country is said to support most of its provisions. Its main objections relate to the regulations governing deep seabed mining in areas beyond the continental shelf.[6]

37. UNCLOS topics of relevance to CCS include the regulation of the territorial sea, exclusive economic zone (**EEZ**) and continental shelf of a coastal state. The territorial sea extends up to a limit of 12 nautical miles measured from baselines determined in accordance with the Convention: Article 3. The sovereignty of a coastal state extends to the airspace over its territorial sea as well as to the territorial sea's bed and subsoil: Article 2(2).

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6 See Office of the US Staff Judge Advocate, 'U.S. Position on the U.N. Convention on the Law of the Sea', 97 International Legal Studies 81 (2021), https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=2949&context=ils.

38. As provided for by UNCLOS, the EEZ of a coastal state extends up to a limit of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured: Article 57.

39. The continental shelf is the locus of much CCS activity. Under UNCLOS, it comprises the seabed and subsoil of the submarine areas that extend beyond a coastal state's territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend up to that distance: Article 76.

40. For the EEZ, the Convention provides that a coastal state has sovereign rights in its EEZ for the purpose of exploring and exploiting, conserving and managing the natural resources of the waters super-adjacent to the seabed and of the seabed and its subsoil, as well as with regard to other activities for the economic exploitation and exploration of the EEZ. The coastal state also has jurisdiction to protect and preserve the EEZ's marine environment.

41. A coastal state, in exercising its rights in the EEZ, is to have due regard to the rights of other states: Article 56. A state exercising its rights in the EEZ of another state is to have due regard to the rights of the coastal state and is to comply with the laws and regulations adopted by the coastal state in accordance with the provisions of international law, including UNCLOS: Article 58.

42. For the continental shelf, the Convention provides that a coastal state has sovereign rights for the purpose of exploring the shelf and exploiting its natural resources: Article 77. The rights include the right to authorize and regulate drilling on the continental shelf for all purposes and to tunnel into the continental shelf: Articles 81 and 85. These rights are exclusive, in the sense that where a coastal state does not explore the continental shelf or exploit its natural resources, no-one may undertake such activities without the express consent of the coastal state.

43. UNCLOS creates a general obligation on states to protect and preserve the marine environment: Article 192. A state's sovereign right to exploit its natural resources in its territorial sea and EEZ, as well as on its continental shelf, is subject to the obligation to protect and preserve the marine environment: Article 193.

44. States are to take all measures necessary, acting individually or jointly (as appropriate), to prevent, reduce and control pollution of the marine environment from any source, using, for this purpose, the best practicable means at their disposal. They are also to endeavour to harmonise their policies in this regard: Article 194(1).

45. A state is to conduct its activities within its jurisdiction or control in such a way so as not to cause damage by pollution to the environment of another state. It is also to ensure that any pollution arising from activities under its jurisdiction or control does not spread beyond the areas where it exercises sovereign rights: Article 194(2). This set of rules is very old and well established and is considered customary international law (meaning that it is binding law on a state irrespective of whether the treaty that gives it expression it has been acceded to by the state).[7]

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7 The rule that a state has the sovereign right to exploit its own resources subject to the responsibility to ensure that activities within its jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction has been affirmed as a rule of customary international law by the International Court of Justice, in the *Pulp Mills case (Argentina v. Uruguay), Judgment, ICJ Reports 2010, para. 101. In a marine environment, pollution even in internal waters can be carried well beyond the limits of national jurisdiction.*

46. The measures taken by a state (or states jointly) to prevent, reduce and control pollution of the marine environment are to deal with all sources of pollution and are to minimize to the fullest possible extent the release of toxic, harmful or noxious substances, especially those that are persistent. Those measures are also to reduce (see Article 194(3) and (5)):

    a. pollution from vessels, in particular through measures to prevent accidents and deal with emergencies, ensure the safety of operations at sea, prevent intentional and unintentional discharges, and regulate the design, construction, equipment and operation of vessels;

    b. pollution from installations and devices used in exploration or exploitation of the natural resources of the seabed and subsoil, in particular through measures to prevent accidents and deal with emergencies, ensure the safety of operations at sea, and regulate the design, construction, equipment and operation of such installations or devices; and

    c. pollution from other installations and devices operating in the marine environment, in particular through measures to prevent accidents and deal with emergencies, ensure the safety of operations at sea, and regulate the design, construction, equipment and operation of such installations or devices,

    the above measures are to include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life.

47. Other rules created by UNCLOS of relevance to CCS include:

    a. in taking measures to prevent, reduce and control pollution of the marine environment, states are not to transfer, directly or indirectly, damage or hazards from one area to another or transform one type of pollution into another: Article 195;

    b. states are to take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction or control which may cause significant or harmful changes to that environment: Article 196;

    c. states are to endeavour to observe, measure, evaluate and analyse, by recognised scientific methods, the risks or effects of pollution of the marine environment: Article 204; and

    d. coastal states are to adopt laws and regulations to prevent, reduce and control pollution of the marine environment arising from or in connection with seabed activities subject to their jurisdiction. These laws and regulations are to be no less effective than international rules, standards and recommended practices and procedures: Article 208.

48. While the above rules, like most international law rules considered in this analysis, apply to states in their mutual relations, private operators of CCS activities will need to be aware of them because states, as indicated in the introduction to this analysis, are required under UNCLOS to regulate the activities of private operators domestically in order to avoid liability for themselves under international law: see Article 235(1) and the “enforcement” part of UNCLOS, especially Articles 211-220.

49. UNCLOS also contains anti-dumping provisions. States are to adopt laws and regulations to prevent, reduce and control pollution of the marine environment by dumping. Such laws and regulations are to ensure that dumping is not carried out without the permission of the competent state authorities.

50. Dumping within the territorial sea and EEZ of a state, or onto a state's continental shelf, is not to be carried out without the express prior approval of the state, which has the right to permit, regulate and control such dumping after due consideration of the matter with any other state which, by reason of its geographical situation, may be adversely affected by such action. National laws, regulations and measures in this context are, again, to be no less effective in preventing, reducing and controlling such pollution than corresponding global rules and standards: Article 210.

51. In order to appreciate how UNCLOS affects the special aspect of the CCS process, namely CO_2 handling, it is necessary to consider the Convention's definition of "pollution of the marine environment". The term is defined as the introduction by human beings, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water or reduction of amenities.

52. We note that the introduction of CO_2 into sub-seabed reservoirs neither normally results, nor is it likely to result, in harm to living resources and marine life, hazards, etc. Therefore, it is unlikely that CCS's particular focus on capturing, transporting and sequestering CO_2 would lead to state liability (or private operator liability) as a direct (or indirect) application of UNCLOS. Having said that, on a "purposive" interpretation of the provisions of UNCLOS addressing protection of the marine environment, it is frequently the case that individual state jurisdictions require permits or authorisations to be obtained for disposal of CO_2 in geological reservoirs in the seabed and that such permits / authorisations build in conditions concerning environmental protection. We address such domestic legislation for the select jurisdictions covered in the Phase 1 Works below.

SNAPSHOT

Where it is not clear whether a substance or a process is regulated by a treaty or by domestic law under it, a "purposive" interpretation of the treaty (or law) may provide the answer. However, this may still leave enough doubt to support legal action against a CCS proponent. UNCLOS reveals that a state has extensive discretion on where and how it is to exploit its natural resources. UNCLOS indicates that the explicit and detailed consent of a state to CCS operations in its territory (territorial sea, EEZ or continental shelf) is a vital preliminary step to managing liability risks.

53. It should also be noted that the definition of "dumping" in UNCLOS (Article 1(1)(5)) follows the 1992 London Convention: dumping is defined, relevantly, as the deliberate disposal of wastes or other matter from vessels, etc., at sea. The CCS process does not dispose of CO_2 "at sea" but seeks to place it in underground reservoirs. Therefore, it can be argued that CO_2 disposal through the CCS process escapes the dumping restriction, although there is a level of uncertainty in this regard.

54. While fugitive CO_2 may enter the water column during injection operations or could escape from storage, the amounts would normally be small and be excused under the "incidental" exception.[8]

8 "Dumping" under UNCLOS (as under the London Convention) does not include the disposal of wastes or other matter incidental to, or derived from, the normal operations of vessels, platforms, etc., nor does it include placement of matter for a purpose other than the mere disposal of that matter, provided that such placement is not contrary to the aims of the Convention: Article 1(1)(5)(b).

55. Leaving aside CO_2 and its properties as such, the industrial nature and scale of CCS, as with any heavy industry that involves the transportation of matter across land and sea, can be expected to give rise to various liability risks under UNCLOS and corresponding domestic legislation, as has already been indicated.

56. Nevertheless, it should be noted that the rules referred to above on the coastal state's rights over its continental shelf (and a fortiori its territorial sea) are supportive of CCS in principle, affirming as they do a state's right to exploit its natural resources as it sees fit, subject to the Convention's requirements (which overlap with those of customary international law) on environmental protection.

1989 – Basel Convention (as amended)

57. The Basel Convention is another "hazardous wastes" treaty but with an emphasis on transboundary movement (by land as well as by sea) and protection of developing countries.

58. Under the Convention, states are to take "necessary measures" to ensure that the management of hazardous wastes and other wastes, including during their transboundary movement and disposal, is not inconsistent with the protection of human health and the environment. Transboundary transport of hazardous wastes, especially from developed to developing countries, is presumed under the Convention to most likely not constitute environmentally sound management. As far as is compatible with environmentally sound – but also efficient – management, such waste is to be disposed of in the state in which it is generated.

59. However, the transboundary movement of hazardous waste (and other forms of waste) is permitted under the Convention when the transport and the ultimate disposal of it is environmentally sound.

60. The main rights and obligations of state parties under the Basel Convention are set out in Article 4. It will be noted that they affect non-parties to the Convention in addition to parties.

61. Each Basel Convention party has a right to prohibit the import of hazardous wastes or other wastes for disposal in its territory: Article 4. This right is exercised by notifying the other parties to the Convention of its decision. Once notified, these parties are to prohibit the export of hazardous and other wastes to the notifying party. Even in the absence of a notification, the export of hazardous and other wastes from one party to another is to be prohibited unless the state of import has consented in writing to the specific import. A party is also not to permit hazardous or other wastes to be exported to a non-party or to be imported from a non-party. As a result, a transboundary activity may violate the treaty even where it implicates a non-party.

62. Further, each party to the Basel Convention is to take appropriate measures to ensure that the transboundary movement of hazardous wastes and other wastes is reduced to the minimum consistent with the environmentally sound and efficient management of such wastes, and, where it is carried out, it is carried out in a manner that protects human health and the environment.

63. Even where export or import of a waste has been permitted, a party is not to proceed with the export or import of that waste where it has reason to believe that the waste in question will not be managed in an environmentally sound manner, whether in its own territory or that of another state, including a non-party state.

64. In the domestic legislation of state parties, the trafficking of hazardous and other wastes in violation of the provisions of the Convention is to be treated as a crime and punished accordingly.

SNAPSHOT

Non-parties to a treaty (and private operators within it) may be affected by a treaty's reach. Several of the treaties examined in this section seek to control conduct that happens outside the territorial jurisdiction of treaty parties.

65. For the purposes of CCS, and CO_2 in particular, it remains to be considered how some of the key terms of the Basel Convention are defined.

66. The Convention uses lists contained in three annexes to define what constitutes "hazardous waste" and "other waste" for the purposes of the Convention. "Waste" is a substance that is disposed of or is intended to be disposed of. "Disposal" includes deep injection of a substance into wells or naturally occurring repositories for permanent storage. A "hazardous waste" is any waste listed in Annex I, except where the waste does not possess any of the characteristics contained in Annex III. Alternatively, a waste is a hazardous waste where it is so defined by the domestic legislation of the party of export, import or transit. Annex II lists wastes that are regulated as "other wastes" under the Convention.

67. While CCS engages in an act of "disposal" as provided for in Annex IV to the Basel Convention (where "disposal" is a concept distinct from the concept of "hazardous waste"), CO_2 is not captured by any of the Convention's definitions of "waste" in Annexes I and II, nor is it commonly known to be a hazardous waste in the domestic legislation of any party to the Convention.

68. It might be an arguable position that liquefied CO_2 (i.e. CO_2 in a highly compressed state) might qualify as a hazardous waste under the Basel Convention.[9] However, the only Annex I waste category that CO_2 conceivably fits is category Y15, which is defined as: "Wastes of an explosive nature not subject to other legislation". It is well known that CO_2 is not by "nature" explosive. Not only that, but in order for CO_2 to be a controlled substance under the Basel Convention it must possess a character listed in Annex III. The only conceivable such character would be H1, namely "Explosive", which is defined as: "An explosive substance or waste is a solid or liquid substance or waste (or mixture of substances or wastes) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings." While liquified CO_2 may be explosive when under pressure, it is not explosive for being "in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings" (emphasis added). In light of the foregoing, we consider that there will be very few circumstances (if any) where CO_2 would qualify as a "hazardous waste" in the senses described in this paragraph.

69. Other aspects of CCS (which we have above characterised as the "general" aspects of CCS which faces risks common to all heavy industry) may give rise to liability under the Convention. CCS operators engaged in "transboundary movement"[10] of CO_2 should attend, in particular, to any wastes that may accompany their operations, including any wastes admixed with the CO_2 transported for disposal.

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9 As has been argued, as a possibility, by A. Raine, 'Transboundary Transportation of CO_2 Associated with Carbon Capture and Storage Projects: An Analysis of Issues under International Law', 2 CCLR 353 (2008).

10 "Transboundary movement" is defined in the Basel Convention as any movement of hazardous wastes or other wastes from an area under the national jurisdiction of one state to, or through, an area under the national jurisdiction of another state, or to, or through, an area not under the national jurisdiction of any state, provided at least two states are involved in the movement. "Area under the national jurisdiction of a state" means any land, marine area or airspace within which a state exercises administrative and regulatory responsibility in accordance with international law in regard to the protection of human health or the environment.

1991 – Espoo Convention

70. The Espoo Convention is a regional treaty with 45 parties, including the EU member states.

71. The Convention requires its parties to assess the environmental impacts of their transboundary activities already in the early stages of planning. Significant adverse transboundary environmental impacts are to be prevented, reduced and controlled through appropriate and effective measures: Article 2 of the Convention.

72. While CO_2-related activities are not on the list of activities requiring environmental impact assessment contained in Appendix I to the Espoo Convention, Appendix III lays down general criteria to assist in the determination of whether an activity not listed in Appendix I could potentially have a significant transboundary environmental impact which would require an impact assessment. The criteria relate to the size of the project, its location (for example, close to environmentally sensitive areas) and the potential effects of the proposed activity.

73. Transboundary CCS project activities conducted within the territory of, or by parties to the Espoo Convention may trigger its requirements (or their corresponding domestic expression) for environmental impact assessment (including in relation to fugitive CO_2), and any party to the Convention involved in such a CCS activity would be under an obligation to determine whether the criteria set out in Appendix III to the Convention apply to that CCS activity – and, if so, to initiate transboundary environmental impact assessment and consultation with the potentially affected states.

1992 – Helsinki Convention

74. The 1992 Helsinki Convention (as amended) has as its objective the protection of the "Baltic Sea Area" (as defined by Article 1 of the Convention), including the inland waters, from all sources of pollution from land, air and sea. It further commits its ten contracting parties (one of which is the European Union and one of which is Denmark) to take measures to conserve natural habitats and biological diversity in the area, as well as the sustainable use of marine resources.

75. The Helsinki Convention's definition of "pollution" ("introduction by man … of substances or energy into the sea … which are liable to create hazards to human health, to harm living resources and marine ecosystems, to cause hindrance to legitimate uses of the sea … to impair the quality for use of sea water, and to lead to a reduction of amenities") is materially the same as UNCLOS's definition of the term "pollution of the marine environment". This definition of "pollution" evidently does not seek to cover CO_2.

76. The Helsinki Convention's two other pollution-related concepts, "harmful substance" and "hazardous substance", are defined in ways that are also unlikely to cover CO_2.

77. However, the Helsinki Convention's definition of "dumping" extends UNCLOS's definition of the same term to disposal "into the seabed" of wastes or other matter from ships or other artificial structures at sea. Even if CO_2 is not regarded as a "waste", it will fall under "other matter", whose meaning is left open in the treaty text. This makes the Helsinki Convention of direct relevance to CCS activities, as Article 11 of the Convention prohibits, in effect, sub-seabed dumping throughout the Baltic Sea Area.

78. "Dumping" as defined in the Helsinki Convention is similar in effect to the definition of "dumping" in the 1996 London Protocol (see below). However, whereas the latter treaty provides an exception for "dumping" CO_2 via geological sequestration, the Helsinki Convention does not.

79. As there is no exception in the Helsinki Convention that would allow for geological sequestration to be performed in the Baltic Sea Area, this restriction can only be overcome through a treaty amendment. We are not aware of any efforts currently underway in that direction.

80. We have checked the Global CCS Institute's Global Status Report for 2024, which includes maps of CCS operations in Northern Europe, against the Baltic Sea Area's extent. From this comparison we understand that no geological sequestration activities are occurring in the waters of the Baltic Sea Area (although several CCS activities are shown as occurring on land in that region).

1992 – CBD

81. The CBD is a treaty on environmental protection that may have some relevance to CCS in its general (not specifically CO_2) aspect.

82. The CBD is a framework convention that aims to conserve biodiversity, promote sustainable use of its components and ensure the fair and equitable sharing of benefits from genetic resources. It lays down several principles of quasi-legal standing, including that states are responsible for conserving their biological diversity and for using their biological resources in a sustainable manner; and that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty is not to be used as a reason for postponing measures to avoid or minimize such a threat (the so-called precautionary principle). At Article 3, the CBD reiterates the principle of customary international law that every state, while entitled to exploit its own resources pursuant to its own environmental policies, has the responsibility to ensure that activities within its jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction.

83. The CBD defines "biological diversity" as the variability among living organisms of all kinds, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. The treaty protects and promotes diversity within species, between species and within and between ecosystems. "Sustainable use" in the treaty means the use of components of biological diversity in a way that does not lead to their long-term decline, so as to maintain the potential of biological diversity to meet the needs of present and future generations (the principle of intergenerational equity).

84. As indicated in the above definitions, the CBD applies to marine as much as to land environments. Article 4 of the treaty entails that, for a coastal state, the CBD's provisions apply to the whole of the state's continental shelf (as delimited by UNCLOS) as well as to "processes and activities, regardless of where their effects occur, carried out under its jurisdiction or control, within the area of its national jurisdiction or beyond the limits of national jurisdiction".

85. A state party to the CBD is required to develop national strategies, plans or programs for the conservation and sustainable use of biological diversity and is also required to integrate, as far as possible, the conservation and sustainable use of biological diversity into domestic sectoral or cross-sectoral plans, programs and policies: Article 6. However, it should also be noted that the CBD, at the same time, provides that economic and social development and poverty eradication are the first and overriding priorities of developing countries.

86. Some developing countries with exceptionally high levels of biodiversity, including Indonesia and Brazil (SOIs in this study), have strict biodiversity regulation in place, inspired by the CBD and by growing threats to their biodiversity. A CCS operation with possible biodiversity implications in these countries could seek tailored legal advice on this aspect of operations. The most likely (indirect) impact of the CBD on a CCS

operation is environmental impact assessment (EIA), or, more particularly, biodiversity impact assessment. Article 14 of the CBD requires each party to introduce procedures requiring EIA of proposed projects that are likely to have significant adverse effects on biological diversity, with a view to avoiding or minimizing such effects. This regulation must allow for public participation in such procedures where appropriate.

1992 – OSPAR Convention

87. This is a convention of limited membership with a focus on the marine environment of the North-East Atlantic. It deliberately overlaps with treaties with similar objectives, but lays down more stringent measures with respect to the prevention and elimination of pollution of the marine environment than are found in the other international agreements, whose scope is global.

88. The OSPAR Convention addresses all sources of pollution of the marine environment and the adverse effects of human activities upon it. It is the first of the treaties examined in this study to cite the legal principle that the costs of pollution are to be borne by the polluter: Article 2(2).

SNAPSHOT

CCS activities carried out within the jurisdiction of regional treaties, such as OSPAR, call for heightened legal awareness by operators, as the very point of such treaties is to make up for what their members consider lower standards under more global treaties (whose bar, it is presumed, has been lowered through compromises).

89. The OSPAR state parties are to take, individually and jointly, "all possible steps" (Article 4) to prevent and eliminate pollution by dumping or incineration of wastes or other matter at sea in accordance with the provisions of the Convention, and in particular Annex II. Article 3 of Annex II provides that any dumping of wastes or other matter of any kind is prohibited, except for certain listed substances, including "carbon dioxide streams from carbon dioxide capture processes for storage", provided that:

    a. disposal of the CO_2 streams is into a sub-soil geological formation;

    b. the streams consist overwhelmingly of carbon dioxide (although they may contain incidental associated substances derived from the source material and the capture, transport and storage processes used);

    c. no wastes or other matter have been added to the streams for the purpose of disposing of those wastes or other matter; and

    d. the CO_2 is intended to be retained in the formations permanently and will not lead to significant adverse consequences for the marine environment, human health and other legitimate uses of the maritime area.

90. Disposal of CO_2 through the CCS process is therefore permitted under OSPAR, although subject to authorisation from the host state party: Article 4(1) of Annex II.[11]

11 An identical scheme is set up for dumping from, specifically, "offshore installations"; see Article 5 of the OSPAR Convention, read together with Annex III, Article 3, to the Convention.

91. Although the OSPAR Convention makes a specific exception for CO_2 sequestration (subject to conditions), other aspects of the CCS process will need to be attended to for the purposes of avoiding liability in CCS operations. "Pollution" under OSPAR is defined broadly (as it is under UNCLOS) to mean the introduction by human beings, directly or indirectly, of substances or energy into the maritime area which results, or is likely to result, in hazards to human health, harm to living resources and marine ecosystems, damage to amenities or interference with legitimate uses of the sea. The definition of "maritime area" notably covers the high seas, albeit only the high seas within the defined region of the North-East Atlantic: Article 1.

92. While dumping under OSPAR's definition does not include "incidental" dumping (which most likely excuses, therefore, regular amounts of fugitive CO_2 from the CCS process), other CCS activities might lead to liability under this Convention, which aims to enforce, as has been noted, higher standards than other treaties with similar objectives – for example, with regard to disused offshore pipelines (see Annex III to the Convention), which could well be an aspect of CCS activities.

93. It follows that CCS operations carried out in OSPAR Convention parties (including Denmark and the United Kingdom) call for careful due diligence prior to commencement.

1996 – London Protocol, as amended in 2006

94. The London Protocol replaces the London Convention for states acceding to both (Article 23). The Protocol recalls "the achievements" of the London Convention "and especially the evolution towards approaches based on precaution and prevention". It seeks, nevertheless, to strengthen the earlier regime, for the better protection and preservation of the marine environment.

95. To this end, the Protocol redefines "dumping" to include "any storage of wastes or other matter in the seabed and the subsoil thereof from vessels, aircraft, platforms or other man-made structures at sea": Article 1(4)(1). The definition of "sea" is modified accordingly to mean all marine waters, other than the internal waters of states, "as well as the seabed and the subsoil thereof" (although not sub-seabed repositories accessed only from land).

96. State parties to the London Protocol are to prohibit the dumping of all wastes or other matter, with the exception of those listed in Annex 1. The dumping of wastes or other matter listed in Annex 1 requires a permit to be issued by a designated domestic authority: see Articles 4, 9 and 10 (noting that a permit may be needed even where a vessel is loading waste in the territory of a non-state party).

97. Annex 1 lists "Carbon dioxide streams from carbon dioxide capture processes for sequestration" among the wastes or other matter that may be considered for dumping.[12] CO_2 streams may be considered for dumping only on the following conditions:

    a. disposal of the CO_2 is into a sub-seabed geological formation;

    b. the CO_2 stream consists overwhelmingly of carbon dioxide (although it may contain incidental associated substances derived from the source material and the capture and sequestration processes used);

    c. no wastes or other matter are added to the CO_2 for the purposes of disposal.

12 This was the amendment introduced in 2006.

98. Therefore, with respect to the special aspect of CCS (the handling of CO_2), the London Protocol presents no significant impediment to CO_2 sequestration itself, as long as the proper permit is obtained from the local authority and the three Annex 1 conditions are adhered to.

99. However, the Protocol persists in presenting a formal obstacle to CSS, in particular transboundary CCS, due to its provision at Article 6: "Contracting Parties shall not allow the export of wastes or other matter to other countries for dumping or incineration at sea." The wording is such that, as long as "dumping or incineration" of the waste is intended, export of the waste from a state party is prohibited irrespective of whether Annex 1 specifically allows for it to be considered for dumping (as it does for CO_2). Therefore, Article 6 has the effect of prohibiting the export of CO_2 as part of the CCS process.

100. This is the first of the treaties (indeed, the only treaty) reviewed in this analysis in which the special aspect of CCS (namely, CO_2) creates a liability that limits CCS operations. The parties to the London Protocol have sought to overcome the obstacle by pursuing an amendment to the Protocol that exempts CO_2 from the Article 6 prohibition.[13] However, the amendment, despite being opened for acceptance in 2009, still has not been accepted by the necessary number of parties to be confirmed.

101. To overcome this second difficulty, the London Protocol parties have been enabled to provisionally apply the proposed amendment.[14] Several states with an interest in transboundary CCS, including Australia, Denmark, the Republic of Korea and the United Kingdom, have fulfilled the conditions of provisional application.

SNAPSHOT

For several state parties to the London Protocol, especially those located in north-western Europe, which is home to CCS hub activity, the Protocol no longer presents any significant legal difficulty in collaboratively implemented CCS, although it is to be noted that considerable time may be taken up in negotiating the required bilateral agreements or arrangements between states in order to facilitate provisional application of the amendment to Article 6.

13 Article 6, as proposed to be amended by Resolution LP.3(4) of the parties to the London Protocol (adopted on 30 October 2009), adds a second paragraph to Article 6, as follows: "2. Notwithstanding paragraph 1 [which remains unaltered but for the paragraph's numbering], the export of carbon dioxide streams for disposal in accordance with annex 1 may occur, provided that an agreement or arrangement has been entered into by the countries concerned. Such an agreement or arrangement shall include: 2.1 confirmation and allocation of permitting responsibilities between the exporting and receiving countries, consistent with the provisions of this Protocol and other applicable international law; and 2.2 in the case of export to non-Contracting Parties, provisions at a minimum equivalent to those contained in this Protocol, including those relating to the issuance of permits and permit conditions for complying with the provisions of annex 2, to ensure that the agreement or arrangement does not derogate from the obligations of Contracting Parties under this Protocol to protect and preserve the marine environment."

14 Resolution LP.5(14), on the Provisional Application of the 2009 Amendment to Article 6 of the London Protocol (adopted on 11 October 2019), provides as follows: "1 Decides to allow for the provisional application of the 2009 amendment pending its entry into force by those Contracting Parties which have deposited a declaration on provisional application of the 2009 amendment; 2 Invites Contracting Parties to deposit with the Depositary a declaration on provisional application of the 2009 amendment of the London Protocol pending its entry into force; 3 Further recalls the obligation to notify the Depositary of agreements or arrangements mentioned in article 6, paragraph 2 of the London Protocol (as amended by resolution LP.3(4)); 4 Affirms that the export of carbon dioxide under the provisional application of article 6 of the London Protocol (as amended by resolution LP.3(4)), and in compliance with the requirements of paragraph 2 of the article (as amended by resolution LP.3(4)) will not be in breach of article 6 as in force at the time of the export."

102. However, as always, attention must also be paid to the general aspects of CCS and the liability risks that may arise for CCS operations from the Protocol's provisions on environmental protection, which are considerably more stringent than those of the London Convention and which seek to apply not only the precautionary principle but also the principle that the polluter must pay: Article 3.

103. Domestic legislation has been passed in several jurisdictions, including those select jurisdictions covered by the Phase 1 Works below, to establish permitting procedures for offshore geological sequestration of CO_2 below the seabed. These permitting procedures are generally designed to give effect to the overarching principles / requirements for environmental protection and management set down by the London Protocol.

2010 – HNS Convention and Protocol (not yet in force)

104. Amongst the criteria for entry into force of the HNS treaty is that at least 12 states have ratified the Protocol (the Protocol supersedes the Convention and incorporates it in amended form), four of which each have a merchant shipping fleet of 2 million units of gross tonnage or more.

105. Of the eight states that have ratified the treaty so far (namely Canada and Denmark, being SOIs, as well as Estonia, France, Norway, Slovakia, South Africa and Turkey), four states (including the two SOIs) do meet that requirement. The expected date of ratification by a sufficient number of parties is not known.

106. Should the HNS treaty come into force, it will be of relevance to CCS in its general aspect.

107. Article 1 of the HNS treaty defines "hazardous and noxious substances" (HNS) to include:

a. any substances, materials and articles carried on board a ship as cargo, including oils, carried in bulk;

b. noxious liquid substances, carried in bulk;

c. dangerous liquid substances carried in bulk;

d. dangerous, hazardous and harmful substances, materials and articles in packaged form;

e. liquefied gases, including CO_2;

f. liquid substances carried in bulk with a flashpoint not exceeding 60°C; and

g. solid bulk materials possessing chemical hazards.

108. "Damage" according to the treaty includes:

a. loss of life or personal injury on board or outside the ship carrying HNS caused by those substances;

b. loss of or damage to property outside the ship carrying HNS caused by those substances;

c. loss or damage by contamination of the environment caused by HNS; and

d. the costs of preventive measures.

109. The treaty provides that where it is not reasonably possible to separate damage caused by HNS from that caused by other factors, all damage shall be deemed to be caused by HNS. Damaged objects to be considered when assessing the damage caused by HNS include (at Article 3):

a. any damage caused in the territory, including the territorial sea, of a state party;

b. damage by contamination of the environment caused in the EEZ of a state party; and

c. damage, other than damage by contamination of the environment, caused outside the territory, including the territorial sea, of any state, if this damage has been caused by a substance carried on board a ship registered in a state party or, in the case of an unregistered ship, on board a ship entitled to fly the flag of a state party.

110. Damage is temporally limited to damage caused by HNS during "carriage by sea", defined as the period from the time when the HNS enters any part of the ship's equipment, upon loading, to the time it ceases to be present in any part of the ship's equipment, upon discharge. If no ship's equipment is used for the carriage, the period begins and ends when the HNS crosses the ship's rail. The liability for CCS operations under the treaty is therefore limited to the period of transport by ship and injection into storage, but only where the injection occurs directly from aboard a ship, which is to be distinguished from the situation of offloading the gas into a receiving facility prior to injection.

111. In this connection, it is to be noted that the development of ships equipped with direct injection technology has been considered by participants in the CCS industry[15] as well as in academic literature,[16] even if there is as yet no such practice.

112. According to Article 7 of the treaty, liability for damage caused by HNS in connection with the carriage of HNS by sea aboard a ship attaches to the ship's owner at the time of an incident.[17] The treaty quantifies owner liability through the concept of a "unit of account", defined as a Special Drawing Right (**SDR**) under the International Monetary Fund (at the time of writing an SDR was worth around US$1.3). Article 9 of the treaty provides that the shipowner's liability under the Convention in respect of any one incident is capped at 100 million units of account (depending on the ship's tonnage).

15 See, e.g., DNV, ' CO_2 Offshore Injection', at https://www.dnv.com/article/co2-offshore-injection-joint-industry-project/.

16 E.g. D'Amore et al., 'Optimisation of ship-based CO_2 transport chains from Southern Europe to the North Sea', 10 Carbon Capture Science & Technology (March 2024), at https://www.sciencedirect.com/science/article/pii/S2772656823000763.

17 "Owner" under the HNS treaty means the person or persons registered as the owner of the ship or, in the absence of registration, the person or persons owning the ship. However, in the case of a ship owned by a state and operated by a company which in that state is registered as the ship's operator, "owner" is to mean that company.

Climate treaties

113. This part considers the implications for CCS activities of the three global treaties addressing climate change. All three treaties aim to reduce global greenhouse gas (GHG) emissions. As a technology that captures and removes CO_2 (pre- or post-emission), the CCS process contributes to the central goal of the climate treaties. These treaties, therefore, are generally supportive of CCS. However, they do not displace the state obligations reviewed under the previous part.

114. A summary overview of the climate treaties and their CCS relevance is provided in Table 2 below.

TABLE 2. Climate treaties and their relevance to CCS activities. All SOIs have ratified these treaties except, as indicated, the United States.

Treaty	No. of parties	Key provisions	Relevance to CCS
UNFCCC: 1992 United Nations Framework Convention on Climate Change	**198** All SOIs	The Convention creates three categories of states (Annex I, Annex II, and states not in either Annex) with different but overlapping obligations. The main difference is that the Annex states are expected to reduce their GHG emissions absolutely from a baseline year (generally 1990). The Annex / non-Annex distinction was carried into the Kyoto Protocol, but is much diminished in the Paris Agreement. The Convention links continued use of fossil fuels with poverty eradication in developing countries. CCS activities are impliedly supported. The Convention's reporting rules include rules for reporting CCS activities (next box).	**Supportive in principle:** The Convention indicates that a wide range of mitigation measures are necessary, using terms that impliedly include CCS among the technologies that should be pursued. Ongoing use of fossil fuels and even growth in such use is recognised as inevitable due to cost factors and a dependence of many countries on the sale or use of fossil fuels.
UNFCCC (cont.)		**IPCC reporting rules:** The Intergovernmental Panel on Climate Change (IPCC) devised reporting guidance for national GHG inventories. These were adopted by the UNFCCC parties as rules to be followed for reporting purposes. The 1996 guidelines were updated in 2006.	**High:** A chapter in the IPCC's 2006 reporting guidelines gives complete reporting guidance for GHGs from CCS activities.

Treaty	No. of parties	Key provisions	Relevance to CCS
Kyoto Protocol: 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change	**192** All SOIs, exc. US	The Kyoto Protocol, as of the expiry of its second commitment period in 2020, is no longer an actively implemented treaty. The Protocol advocates CCS as a mitigation technology, evidencing for the first time in a treaty explicit state acceptance of CCS. The Protocol is unique in assigning fixed emission amounts to states (the Annex I parties only), as well as in allowing states to trade in emission allowances. A further unique feature is a compliance mechanism capable of penalising a state for exceeding its assigned emission amount.	**Supportive in practice:** The Kyoto Protocol supports the policy position that tight limits on GHG emissions must be accompanied by a trading mechanism and an embrace of a broad range of mitigation options, including CCS. Accurate accounting is also needed to enforce such a system.
Kyoto Protocol (cont.)		**Clean Development Mechanism (CDM):** The Kyoto Protocol developed detailed rules for the generation of emission-reduction credits from CCS activities under the CDM trading mechanism. The scheme was not elaborated past 2016 due to the fact that no CCS projects under the CDM had been initiated by that time (when the Paris Agreement went into force, taking the focus away from the Kyoto Protocol).	**High:** Although no CDM credits were issued for CCS activities, the CDM rules are likely to influence the design of rules for CCS credits under Article 6(4) of the Paris Agreement.
Paris Agreement: 2015 Paris Agreement	**194** All SOIs, exc. US18	The Paris Agreement departs from the earlier climate treaties by placing mitigation expectations on all parties. These are not legal commitments, however. Another departure is the placing of a numerical limit on global warming ("well below" 2 degrees C) and a net-zero target for the second half of the century, which implies that residual emissions will need to be sequestered in one way or another. These goals, along with the Agreement's 5-year review cycle, are designed to maximise mitigation action. The Agreement text does not highlight any particular mitigation technologies.	**Strongly supportive:** In December 2023, the Paris Agreement parties called for accelerating efforts toward the phase-down of unabated coal power and accelerating removal technologies such as CCS, particularly in hard-to-abate sectors. It was the first unqualified endorsement of CCS at the global level, affirming the legality of CCS.

18 The Trump Administration's latest act of withdrawal of the United States from the Paris Agreement is due to take effect on or around 20 January 2026, in accordance with Art. 28(2) of the Paris Agreement. (The first Trump Administration had also withdrawn the United States from the Paris Agreement, but the Biden Administration caused the United States to rejoin on 19 February 2021.)

Treaty	No. of parties	Key provisions	Relevance to CCS
Paris Agreement (cont.)		**Article 6 crediting mechanisms:** The Paris Agreement creates two mechanisms for cross-border mitigation effort. The first allows one state to count toward its mitigation target collaborative mitigation effort undertaken with another state. The second creates project-based tradable credits (offsets) that count toward the mitigation target of any state that holds them. The latter mechanism would engage private-sector initiative and help to direct private investment to CCS projects.	**High:** The Article 6 mechanisms were still being developed at the time of this report. It is expected that the CCS modalities and procedures developed in 2011 for the CDM will be adapted to the Article 6(4) scheme, in particular. This may help harmonise CCS regulation across borders.

1992 – UNFCCC (and IPCC reporting)

115. Although the UNFCCC (or "the **Convention**") tends to be overshadowed by the Paris Agreement (below), it remains a living treaty whose principles and practices are incorporated into, or exert an influence on, the Paris Agreement.

116. The Convention draws a distinction between developed and developing countries – or, more accurately, between Annex I and non-Annex countries – for the purposes of the obligation to reduce GHG emissions. The distinction, which (despite resistance from developed countries) has been carried in a weakened form into the Paris Agreement, is of relevance for CCS because it entails that developing countries are entitled to continue to grow their emissions into the indefinite future, in which context a large-scale commitment to CCS becomes inescapable.

117. As an example of the language used, in its preamble, the UNFCCC declares that "the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs". Further, the preamble gives recognition to the "special difficulties" of states that "are particularly dependent on fossil fuel production, use and exportation".

118. Under the Convention, then, both the state consumers of fossil fuels and the state producers of fossil fuels are to be given the time needed to adjust economically.

119. Of the "states of interest" to this study, it may be expected that Brazil, Indonesia and Malaysia are very likely to espouse the view that it is for developed countries to reduce their GHG emissions and not developing countries – at least not without the financial support of developed countries.[19]

120. The political divide entrenched by the UNFCCC tends, if anything, to favour CCS development.

19 Brazil is the originator in the UNFCCC context of the view that developed countries have "historical responsibility" for climate change; see 'Proposed Elements of a Protocol to the United Nations Framework Convention on Climate Change, Presented by Brazil in Response to the Berlin Mandate', 1997, reproduced in UN Doc. FCCC/AGBM/1997/MISC.1/Add.3.

121. The UNFCCC does not rank mitigation technologies but rather encourages the deployment of a full range of them. This may be a consequence of the Convention's results-based objective, encapsulated in Article 2: "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". That level was not further specified in the Convention; however, in 2009, at the 15th Conference of the Parties, it was in effect set at 2 degrees Celsius. It has become standard practice since then to work backward from that level to the actions necessary to ensure that it is not crossed.

122. Article 4 of the Convention, which lists the "commitments" of parties, provides, among other things, that all parties are to:

    a. develop and periodically update and publish national inventories of anthropogenic GHG emissions by sources and removals by sinks using comparable methodologies;

    b. formulate, implement, publish and regularly update national programs containing measures to mitigate climate change by addressing GHG emissions by sources and removals by sinks;

    c. promote and cooperate in the development, application and diffusion of environmentally sound technologies and practices that reduce or prevent GHG emissions in all economic sectors, including the energy, transport, industry, agriculture, forestry and waste sectors;[20] and

    d. promote the conservation and enhancement of GHG sinks and reservoirs, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems.

123. These commitments are noteworthy for two reasons. First, they support all technologies that "reduce or prevent" GHG emissions (with CCS can apply to both categories). Second, they promote accountability for GHG emissions and removals by standardising national GHG reporting (see also Article 12).

124. On the second point, the UNFCCC parties have adopted GHG accounting guidelines developed by the Intergovernmental Panel on Climate Change (**IPCC**). Almost all parties have reported their emissions and removals at least once in the recent past.[21] Annex I parties, which have been filing national inventories annually for more than two decades, are required to use guidelines published by the IPCC in 2006. These include complete guidance on reporting emissions from CCS activities.[22]

125. In summary, the key principles governing emissions accounting and liability for CCS activities under the 2006 IPCC guidelines are as follows:

    a. Where Country A exports CO_2 to Country B, Country A should report in its inventory the amount of CO_2 exported to Country B and Country B should report the amount of CO_2 imported from Country A.

    b. The majority of the CO_2 leakage from a CCS system will be associated with the initial CO_2 capture and compression facilities at the start of the pipeline and the injection facilities at the end of the

20 Article 3(3), on "principles", adds the point that cost-effectiveness argues for a full range of mitigation actions. Thus, policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost – and, for this, they should cover all relevant sources, sinks and reservoirs of GHGs.

21 See https://unfccc.int/BR5 for Annex I parties and https://unfccc.int/BURs for non-Annex parties.

22 IPCC, *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Volume 2: Energy, Chapter 5: "Carbon Dioxide Transport, Injection and Geological Storage", 5.1-5.32.

pipeline, with relatively insignificant emissions from the pipeline itself.[23] Thus, accounting for leakage from a CCS system will fall, firstly, on the capture facility, and, secondly, on the injection facility. These may be in the same country or in different countries. If they are in different countries, each facility and country is responsible for accounting for that amount of the leakage that happens in that country. Such responsibilities for leakage may also be addressed in the domestic legislation of the countries concerned.

c. Pipeline leakage of CO_2 in the CCS value chain, while relatively insignificant in quantity, can be estimated using Tier 1 (default) or Tier 3 (installation specific) methods. The owner of the pipeline will be responsible for accounting for these emissions; and, if the pipeline crosses one or more national borders, each country and pipeline owner through which the pipeline passes must account for the CO_2 leakage from the pipeline in that territory.

d. Where transport of CO_2 is by ship instead of pipeline, a different approach is necessary. Default emission factors (Tier 1) for CO_2 leakage during transport by ship are not available. The IPCC recommends that the amount of CO_2 is metered during loading and discharge using flow metering. Losses are to be reported in the IPCC inventory as CO_2 emissions resulting from transport by ship. While losses of CO_2 that occur during passage of a ship over the high seas are not attributed to any country's inventory, a country will need to account for CO_2 leakage that happens while a ship is transiting the country's exclusive economic zone.

e. Once the CO_2 has been injected into its permanent storage reservoir, the IPCC guidelines acknowledge that leakage to the surface or seabed may occur. It is known from experience that this may occur through various means, including unknown legal penetrations, improperly maintained project penetrations or a fault or fracture through the confining layer that intersects the injection zone (noting that projects may identify during initial characterisations and licensing). In the absence of 2006 IPCC guidance on accounting for leakage from a geological storage reservoir, there is no obligation upon States to report on such leakage.[24]

f. If CO_2 is injected in Country A and travels from the storage site to the ground surface or the seabed in Country B and leaks there, Country A (not Country B) is responsible for reporting those leaked CO_2 emissions from the geological storage site.

g. If more than one country utilises a common storage site for CO_2, the country in which the geological storage takes place is responsible for reporting leaked CO_2 emissions from that site. If the CO_2 leakage occurs outside of the host country, the host country is still responsible for reporting those emissions, as described above.

h. There is a possibility that methane emissions, as well as CO_2 emissions, could arise from geological storage reservoirs that contain hydrocarbons. The IPCC guidelines contain no guidance for estimating those methane emissions. Therefore, they need not be accounted for in IPCC-compliant reporting. The IPCC nevertheless states that it would be "good practice" to undertake appropriate

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23 In summarising this aspect of the 2006 IPCC guidelines, we acknowledge that fugitive CO_2 leakage from a CCS system may occur at all stages of the value chain, including at initial CO_2 capture and compression, during transport and at the surface infrastructure associated with sequestration activities. However, the 2006 IPCC guidelines do not seek to prescribe processes and procedures to account for all fugitive CO_2 leakage in the value chain (e.g. fugitive emissions from ships carrying CO_2). Of course, we would accept that, quite apart from the 2006 IPCC guidelines, domestic legal regimes may seek to regulate, in greater detail, the processes and procedures that a CCS system must have in place to account for fugitive CO_2 leakage.

24 Having said this, we acknowledge that, under domestic legal regimes, particular States may make provision for such reporting.

assessment of the potential for methane emissions from such reservoirs and, if relevant, include any such emissions attributable to the CO_2 storage process in the inventory of the facility and country in which the reservoir is located.

126. It follows from the above principles of emission accounting that any captured CO_2 that does not find its way into a final and permanent storage facility for CO_2 must not be accounted for as emission avoidance under the IPCC's 2006 CCS accounting guidelines. This includes not only CO_2 leaked into the atmosphere but also CO_2 that remains at least temporarily captured and is provided or sold to other industries for utilisation. This represents the "Utilisation" component in the term CCUS. In accordance with the general IPCC accounting principle that GHG emissions are reported by the specific sectors that cause those emissions, all captured CO_2 set aside for activities other than CCS (from petroleum extraction in the energy sector to feedstock use in the industrial processes sector) must be accounted for in accordance with the IPCC guidance for those particular activities.

127. Non-Annex parties are required to use the IPCC's "revised" 1996 guidelines for preparing national GHG inventories. The IPPC's revised guidelines do not include guidance on CCS reporting. In the absence of the "revised" 1996 guidelines including guidance on CCS reporting, non-Annex parties are encouraged by the IPCC to improve completeness of their national GHG inventories and emission accounting through use of the 2006 guidelines (which do provide guidance on CCS reporting as explained above). We are aware many non-Annex parties have taken up this suggested approach. There was also a refinement of the IPCC guidelines in 2019, although they do not deal specifically with CCS reporting like the 2006 guidelines do.

128. The consequence for CCS of the rules and practices developed under the Convention is that CCS operations will be required to accurately monitor their emissions (of CO_2 primarily, but also of other GHGs, as applicable) and report them to the appropriate governmental authorities. This is likely to be the case in both developing (non-Annex) and Annex I countries. The reporting obligation may have few consequences for CCS operators where CO_2 emissions are low; but if emissions are high, the economic consequences could be significant.

1997 – Kyoto Protocol

129. The Kyoto Protocol to the UNFCCC introduced a new model of climate change regulation. It proved to be short-lived. The United States signed but did not ratify the treaty. Canada withdrew from the Protocol in 2012. Other Annex I states (including Japan and New Zealand) did not participate in the Protocol's second commitment period (2013-2020). The reason was that the treaty was based on the UNFCCC's division of states into a small group with heavy obligations and a large group with light (or no) obligations. Meanwhile, however, GHG emissions from non-Annex countries grew rapidly and far outstripped those from Annex I parties.

130. Despite the Kyoto Protocol's effective abandonment after only a few years, one aspect of it (with relevance to CCS) proved extremely influential. The Protocol model drove home the point that private initiative needed to be encouraged, through the international instrument itself, in order to support a broad suite of mitigation options at lowest cost. The institution through which this was done was the Clean Development Mechanism (**CDM**), established by Article 12 of the Protocol. The successor treaty to the Protocol (the 2015 Paris Agreement) preserved this feature in modified form.

131. CDM projects based in non-Annex countries created emission allowances (called Certified Emission Reductions, of CERs) through certified "additional" emission-avoidance actions which were sold at open-

market prices to Annex I parties, which used them to offset emissions above their assigned amounts under the Kyoto Protocol, in accordance with Article 3(12).

132. The Protocol, at Article 2(1)(a)(iv), calls for the "promotion, development and increased use of [...] carbon dioxide sequestration technologies". Although it was envisaged that a CDM methodology for the creation of tradeable allowances from CCS activities would be proposed for approval by the CDM Executive Board by CCS proponents,[25] no such methodology finally eventuated.[26] It is nevertheless significant that CCS advanced as far as it did under the CDM. The Protocol states the CDM's purpose to be assisting developing countries to achieve "sustainable development": Article 12(2). The legal implication for CCS of the Protocol's embrace is that it is compatible with sustainable development.

133. Far more important from a liability perspective, however, is that a crediting system such as the CDM's (CERs are a form of credit) not only provides financial support CCS, it also provides some detail on elements of liability that a CCS operation might be subject to. The likelihood that a crediting scheme for CCS will soon emerge from the climate treaties (specifically, from the Paris Agreement's new Article 6(4) mechanism; see below) should give CCS operators confidence that risks will become more manageable, as they become absorbed into standardised activities approved under international law.[27]

SNAPSHOT

The climate treaties generally approach CCS as a mitigation measure that is to be encouraged. The liability they create for private operators (indirectly, through domestic legislation) is primarily focused on accountability for GHG emissions. Under the influence of the climate treaties, GHG emission reporting has become extremely sophisticated. Operators should be alert to the fact that a salient source of legal liability for CCS operations is defective reporting of the amounts of CO_2 handled.

134. The Kyoto Protocol cemented the importance of GHG emission/removal inventories in international law (see Article 5), as liability for a state's failure to comply with its assigned amount could not be made out except on the basis of accurate and trustworthy inventories. Hence Annex I states that policing of domestic GHG reporting increased during the two Kyoto Protocol commitment periods (2008-2012 and 2013-2020). As these practices carried over to the Paris Agreement period, it bears reiterating that CCS operators, who normally handle very large amounts of CO_2 over multiple potential escape points, will need to take particular care with their reporting liabilities under domestic law, which are likely to be demanding everywhere, including in all eleven states of interest in this analysis.

2015 – Paris Agreement (and Article 6 crediting)

135. The Paris Agreement aims to secure mitigation commitments by all parties; however, these do not have the legal force that was given to assigned amounts under the Kyoto Protocol. The result has been that, almost a decade after the Agreement went into force (in 2016), most countries now have "nationally determined

25 UNFCCC, Decision 10/CMP.7, *Modalities and Procedures For Carbon Dioxide Capture and Storage in Geological Formations as Clean Development Mechanism Project Activities*, 2011, UN Doc. FCCC/KP/CMP/2011/10/Add.2. This document offers a glimpse as to how CCS is likely to be developed under Article 6(4) of the Paris Agreement, including in relation to the problem of reversal of storage / non-permanence.

26 See *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on its Twelfth Session, held in Marrakech from 7 to 18 November 2016*, UN Doc. FCCC/KP/CMP/2016/8, para. 29.

27 The *Modalities and Procedures* contained UNFCCC Decision 10/CMP.7, above, are illustrative of the benefits.

contributions" (**NDCs**) promising emission reductions. However, many NDCs have been made conditional upon receipt of external financial support or other contingencies.

136. The Paris Agreement's objective is more precise than the UNFCCC's. It is to hold the increase in the global average temperature to "well below" 2 degrees Celsius and to attempt to limit the increase to no more than 1.5 degrees Celsius: Article 2(1)(a).

137. Of some relevance to CCS is the provision at Article 4(1), that parties are to "aim to reach global peaking of greenhouse gas emissions as soon as possible [...] and to undertake rapid reductions thereafter [...] so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century". In order to achieve a long-term "balance" it will be necessary to remove residual unavoidable emissions through a net expansion of natural forestry sinks (entailing a reversal of current net deforestation) and rapid growth of artificial negative-emission technologies, including CCS. As for scenarios that limit warming to 1.5 degrees Celsius, which is a target that the international community is still pursuing, it is common ground that it would be practically impossible to achieve this particular Paris Agreement target without CCS. It should be noted, however, that the Article 4(1) provision expresses only an "aim", which is not binding on any party.

138. There is an expectation that the mitigation component of each NDC of a party, which must be renewed every five years, is more ambitious than the previous one: Article 4(4). But, again, this is only an expectation that cannot be enforced.

139. Of considerable relevance to CCS is the provision in Article 6(4) of the Paris Agreement setting up a project-based "mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development", along the lines of the CDM – while also being different from the CDM due to the fact that all parties to the Paris Agreement have, or are supposed to have, mitigation targets. An emission reduction under Article 6(4) (termed an A4.6ER) must therefore be "removed" from the host state's inventory when it is sold to another state, to avoid double-counting the credit: Article 6(5). (This was not relevant under the Kyoto Protocol.)

140. The Paris Agreement's Conference of the Parties, in 2021, issued the following instructions to the Supervisory Body, calling, in effect, for the development of a methodology for CCS activities:

> Requests the Supervisory Body to: [...] In the context of developing and approving new methodologies for the mechanism: (i) Review the baseline and monitoring methodologies in use for the clean development mechanism under Article 12 of the Kyoto Protocol with a view to applying them with revisions, as appropriate, pursuant to chapter V.B of the annex (Methodologies) for the activities under the mechanism (hereinafter referred to as Article 6, paragraph 4, activities);
>
> Also requests the Supervisory Body to elaborate and further develop [...] recommendations, for consideration and adoption [...] on: [...] Activities involving removals, including appropriate monitoring, reporting, accounting for removals and crediting periods, addressing reversals, avoidance of leakage, and avoidance of other negative environmental and social impacts.[28]

141. At the time of writing, the Supervisory Body was in the process of developing methodologies and methodological guidance for removal activities.[29] The Supervisory Body has actively sought stakeholder

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28 Paris Agreement, Decision 3/CMA.3, *Rules, Modalities and Procedures for the Mechanism Established by Article 6, Paragraph 4, of the Paris Agreement*, UN Doc. FCCC/PA/CMA/2021/10/Add.1, paras 5-6.

29 https://unfccc.int/process-and-meetings/the-paris-agreement/paris-agreement-crediting-mechanism/methodologies.

input into its development of Paris Agreement crediting mechanism methodologies.[30] The CCS industry can therefore reasonably expect that a methodology for crediting CO_2 emission avoidance resulting from approved CCS activities will be developed in the near future (continuing the CDM's work on CCS, referred to above) and that the CCS industry is likely to have a say in this development.

SNAPSHOT

While no credits have ever been issued under the climate treaties for CCS-type sequestration, the day when this happens is not far off. The fact that CCS is not "business as usual" is to its advantage in this context, because credits are not supposed to reward "non-additional" projects. We expect that the additionality (especially financial additionality) of CCS projects will continue to work strongly in their favour for as long as the cost of storage per tonne of CO_2 significantly exceeds the cost of emission reduction or avoidance of a tonne of CO_2 by means of other commonly deployed mitigation technologies.

142. The Paris Agreement seeks to extend stringent GHG accounting and reporting to all parties. Hence the IPCC's 2006 guidelines on tracking GHG emissions and removals are applicable to all parties.[31]

143. From the perspective of CCS deployment, perhaps the most significant development under the Paris Agreement is the call issued in December 2023 by the parties to the Agreement unambiguously calling for the global expansion of CCS at a rapid rate. This marks an embrace of CCS by the Paris Agreement framework as a key mitigation technology for the future. It is also noteworthy that the December 2023 call listed CCS amongst the more established mitigation technologies.

144. It is worth quoting the relevant paragraph in full to convey the urgency it expresses and the massive scale of action it encapsulates. CCS references are at clauses (b) and (e):

> [The Conference of the Parties] Further recognizes the need for deep, rapid and sustained reductions in greenhouse gas emissions in line with 1.5 degrees Celsius pathways and calls on Parties to contribute to the following global efforts, in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances, pathways and approaches:
>
> a. tripling renewable energy capacity globally and doubling the global average annual rate of energy efficiency improvements by 2030;
>
> b. accelerating efforts towards the phase-down of unabated coal power;
>
> c. accelerating efforts globally towards net zero emission energy systems, utilizing zero- and low-carbon fuels, well before or by around mid-century;
>
> d. transitioning away from fossil fuels in energy systems, in a just, orderly and equitable manner, accelerating action in this critical decade, so as to achieve net zero by 2050 in keeping with the science;

30 https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism/calls-for-input/sb002-requirements-methodologies.

31 See Paris Agreement, Decision 18/CMA.1, *Modalities, Procedures and Guidelines for the Transparency Framework for Action and Support Referred to in Article 13 of the Paris Agreement*, UN Doc. FCCC/PA/CMA/2018/3/Add.2, Annex, para. 20.

e. accelerating zero- and low-emission technologies, including, inter alia, renewables, nuclear, abatement and removal technologies such as carbon capture and utilization and storage, particularly in hard-to-abate sectors, and low-carbon hydrogen production;

f. accelerating the substantial reduction of non-carbon-dioxide emissions globally, in particular methane emissions by 2030;

g. accelerating the reduction of emissions from road transport on a range of pathways, including through development of infrastructure and rapid deployment of zero- and low-emission vehicles; and

h. phasing out inefficient fossil fuel subsidies that do not address energy poverty or just transitions, as soon as possible.[32]

145. The expectation could reasonably be, therefore, that the Paris Agreement will, in time, come to support CCS expansion in practical ways that have the effect of reducing legal liability risks and costs for CCS participants. Not only does the Paris Agreement recognise CCS as an indispensable mitigation technology whose use must be accelerated, the international climate change regime has many years of experience in supporting concrete projects on the ground through standardised "methodologies" (such as the methodologies developed and used under the CDM) that streamline projects, enable them to generate revenue streams through crediting arrangements (e.g. through the Article 6(4) mechanism, as indicated above) and have the broader effect of making them globally entrenched.

Conclusion

146. The high-level analysis of treaties with relevance to CCS activities undertaken above reveals that liability under them takes many forms. Even the older treaties that seem at first sight not to have any relevance to CCS can assume relevance in certain contexts. In terms of actual liability for private operators (as opposed to the state parties themselves), much will depend on how each state has decided to implement each treaty in its domestic jurisdiction, which we address below in this study.

147. Overall, however, the analysis reveals no notable legal constraints percolating from the international level down to the domestic level. If the climate treaties are given prominence – given their special currency – the overall impression is one of encouragement and promise.

148. CCS technology has found support at the level of international climate policy and law, as it has come to be accepted that all significant mitigation technologies will need to be marshalled to meet the Paris Agreement's ambitious targets.

149. Keeping the international law context expounded in this section firmly in mind, we will now address, below, the specific domestic legal and regulatory frameworks in the select jurisdictions covered by the Phase 1 Works.

32 Paris Agreement, Decision 1/CMA.5, *Outcome of the First Global Stocktake*, UN Doc. FCCC/PA/CMA/2023/16/Add.1, para. 28.

Phase 1 works – identify and summarise existing framework

Photo: Adobe Stock

Key observations

150. We have undertaken a comprehensive review of the various transfer liabilities pursuant to the Selected Jurisdictions' CCS regimes and have identified the following key observations:

Observation 1 – a majority of the regimes we selected to include in our analysis allocate liabilities between previous owners / operators, current / future storage owners, and government

151. A majority of jurisdictions clearly identify and allocate liabilities that are applicable to projects based on the stages of the CCS project. Liabilities are generally split into 3 distinct phases: (1) day-to-day operational liabilities during the course of the CCS project's operation; (2) remedial and decommissioning liabilities once injection has ceased; and (3) post-closure liability before it reverts to the relevant Government.

152. We have observed that there are two distinct approaches in which liability is handled. Approach 1 extends liability beyond the existing license holder, whereas approach 2 does not.

153. Under approach 1, an existing license holder is liable (or responsible) for the three phases mentioned above. While the former license holder may not be liable for the day-to-day operational liabilities, they may be liable for remedial and decommissioning liabilities even after they have transferred interest in the license (see Australia, UK, Canada Alberta).

154. Under approach 2, a license holder is relieved from liability (except for very specific circumstances relating to environmental impact), once they transfer their license (see Indonesia, Malaysia).

Observation 2 – none of the Selected Jurisdictions allow for "license conversion"

155. None of the Selected Jurisdictions provide a simple automatic statutory "conversion" of a petroleum license into a CCS license; separate CCS approvals are required though in some (e.g. Australia) existing petroleum titleholders have priority or streamlined access.

Observation 3 – a majority of regimes include post-closure regimes

156. A majority of the Selected Jurisdictions' regimes include post-closure requirements that a licensee must meet before responsibility transfers to the relevant Government. These requirements confer obligations on the existing license holder to undertake various monitoring requirements after injections have ceased and demonstrate that the carbon dioxide stream injected by project has stabilized.

157. Post-closure liability on the titleholder who carried out the CCS activities generally ranges from 15 to 20 years. However, certain jurisdictions have longer periods, such as the US federal regime and Louisiana, which requires post-closure monitoring of 50 or more years (or such timeframe otherwise established on a site-specific basis).

United States of America – Federal

Issue	Comment	Risk
Existence and robustness of CCS regime	Comprehensive liability regime, however, intersection with individual state CCS laws adds a level of complexity	
Liability split between stakeholders	Liability regime focuses solely on existing license holder. Liability of former license holders may be pursuant to commercially agreed transfer agreements	
Post-closure liability	50 year post injection site care period	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

158. At the federal level in the United States (**US**), The Safe Drinking Water Act (SDWA) protects the Nation's drinking water.[33]

159. Pursuant to the SDWA, the Environmental Protection Agency (**EPA**) has designated six classes of injection wells, each storing different materials and each subject to different regulatory requirements.[34] In 2010, EPA promulgated regulations establishing the newest class of wells, Class VI (the Federal Requirements Under the Underground Injection Control (**UIC**) Program for Carbon Dioxide Geologic Sequestration Wells[35] (**federal requirements**). Class VI wells are "used for geologic sequestration of carbon dioxide."[36]

160. Eligible projects that meet the relevant qualifying requirements may also be subject to certain reporting requirements for CO_2 emissions under the Clean Air Act.[37]

161. EPA promulgated the UIC Class VI (**Class VI Rule**) in 2010. Class VI wells are injection wells for the sole purpose of permanent geological sequestration of CO_2 into deep subsurface rock formations. Class VI wells must adhere to unique criteria that are specifically designed to ensure safe and secure geological storage of CO_2. The federal requirements for Class VI well is the primary federal CCS regulatory framework and is therefore the main focus of this section of the Report.

162. The SDWA also creates a scheme of cooperative federalism to regulate UIC wells. States may assume primary enforcement responsibility (primacy) if they obtain EPA approval,[38] and adopt a regulatory regime that meets minimum federal requirements.[39] If a State chooses not to adopt its own UIC program, EPA

33 42 U.S.C. § 300f et seq.
34 40 C.F.R. § 144.6 (2024).
35 40 C.F.R. § 144.6 (2024).
36 40 C.F.R. § 144.6(f).
37 Clean Air Act, 42 U.S.C. §7401 et seq. (1970).
38 42 U.S.C. § 300h-1(b).
39 *id.* § 300h.

regulations apply.[40] And even when States assume primacy, EPA remains responsible for monitoring the program and ensuring compliance with federal law.[41]

163. The EPA has granted primacy for Class VI UIC wells to six states: Wyoming (2018), North Dakota (2020), Louisiana (2024), West Virginia (2025), Arizona (2025), and Texas (2025). These states have comprehensive regulatory regimes and knowledgeable and experienced agencies. These agencies' understanding and experience of their local geology may be able to speed up the permitting backlog at the EPA if undertaken at a more local level. This does however lead to complexity across the US, e.g.:

    a. the Louisiana Legislature granted the Louisiana Department of Office of Conservation and Energy the power to regulate underground injection wells, pursuant to the state's EPA-approved UIC program. However, upon its grants of primacy, permits formerly in the queue for EPA approval immediately transferred to the review and approval by the Louisiana Department, lengthening review and approval timelines;

    b. other states (e.g. Illinois and California), have not sought primacy but have adopted requirements that place requirements on injection activities in relation to the UIC Class VI rules, resulting in participants having to navigate a dual federal and state level CCS regulatory and/or permitting frameworks; and

    c. other states having not enacted nor have the power to enact complete and robust state legislation specific for CCS to fully replace the federal UIC Class VI rule (e.g. California prior to its legislation being granted) continue to rely solely or predominantly on the federal UIC Class VI rule (like the majority of the states not referenced in this Report). This is subject to change, as states such as New Mexico, can seek to enact legislation that would give a state the power to apply for Class VI primacy.

164. While the EPA and federal requirements provide regulations regarding the siting, construction, and operation of injection wells for geological sequestration, land use and ownership laws and associated liabilities have historically been the domain of the states. There are two basic rules followed in the US, the American Rule and the English Rule. The American Rule is the prevailing view and holds that the surface owner owns the pore space. The mineral estate owner owns the natural resource but not the geologic formation that holds the natural resource. Under the English Rule, followed in a minority of jurisdictions, the mineral estate holder owns both the natural resource and the pore space surrounding the natural resource.

165. Offshore seabed carbon storage may reduce some of the concerns over pore space ownership as the number of surface landowners reduces to one (either the state or federal government). In respect of the Selected Jurisdictions that border open-water, Federal waters generally begin nine nautical miles off the coast of Texas and three miles off the coasts of Louisiana, Illinois and California. On November 15, 2021, the Infrastructure Investment and Jobs Act was signed into law and gave the Department of the Interior (**DOI**) the authority to grant a lease, easement, or right-of-way on the Outer Continental Shelf (**OCS**) for long-term sequestration of CO_2 that would otherwise go into the atmosphere. The Bureau of Ocean Energy Management (**BOEM**) is working with the Bureau of Safety and Environmental Enforcement (**BSEE**) on a draft rule to implement this authority over the OCS and CCS projects. Federal OCS and state seabed CCS regulation and permitting has not been considered in further detail in this section of the report.

166. The US section of this Report is current as at November 2025 and some of the states referenced within it may have recently convened (e.g. New Mexico) or are yet to convene (e.g. California or Illinois) their

40 *id.* § 300h-1(c).
41 e.g., § 300h-2(a)(1).

2025 legislature sessions and proposed or recently introduced bills may change policy and/or regulations impacting CCS in the US. It may not be clear at this time what the full impact will be on the CCS industry in each jurisdiction until sessions have adjourned and/or more time has passed for state agencies to provide guidance or draft rules based on powers granted in recently adopted changes.

167. In addition to regulatory guidance specific to Class VI wells, there is separate guidance for Class II wells and the injection of CO_2 for the purpose of enhanced oil or gas-related recovery (**EOR**). A Class II permit holder for an EOR well can apply for the site to become a Class VI well and in certain scenarios, must apply. One such scenario is if there is an increased risk to underground stores of drinking water related to significant storage of CO_2 in the reservoir of a Class II well, in which case a Class VI well permit would be required. The most direct indicator of increased risk is increased pressure in the injection zone related to the significant storage of CO_2, which may then trigger an assessment for whether a Class VI well permit is required. Certain states may have obtained Class II primacy (and not Class VI) and/or may also have their own state regulations that apply to Class II wells. The US Energy Information Administration reports over 900,000 existing oil and gas production wells in the US, some of which may also have CCS activities. Repurposing a well to be solely used for CCS would generally require the same permitting process as for a new Class VI well and the majority of existing Class II wells would not meet the class VI standards in their current condition. This section of the report does not go into further detail on CCS as part of Class II wells at a federal or a state level.

168. In addition to the SDWA and related federal requirements discussed above, the EPA also regulates two other regimes relevant to CCS owners and operators:

a. The EPA sets the national air quality standards and national emission standards for hazardous air pollutants based on periodic scientific review. Owners operators of CCS technology that emits certain pollutants must be compliant with requirements set out in the Clean Air Act.[42] An operator is for example subject to new source review permitting, which mandates, among other actions, certain emission standards and environmental impact assessments be undertaken.

b. Unexpected releases of hazardous substances in reportable quantities are also required to be reported to the EPA under the regime set out in the Comprehensive Environmental Response, Compensation, and Liability Act.

While the EPA establishes minimum air quality standards through the Clean Air Act, states must also develop State Implementation Plans to meet, maintain and enforce these national air pollution standards.

42 Clean Air Act, 42 U.S.C.

Transfer liabilities

SNAPSHOT

There are six categories of wells across the UIC Program, designated by Class. Class VI wells, the most recent category for which regulations have been promulgated, are exclusively for geological sequestration of CO_2. The EPA can grant primary enforcement authority – also known as primacy – to states that apply and meet the EPA's Class VI requirements. At the date of this Chapter, six states have Class VI primacy: Wyoming, North Dakota, Louisiana, West Virginia, Arizona, and Texas.

169. The SDWA and its implementing regulations applies to both "the owner or operator of any facility or activity subject to regulation under the UIC program". The federal requirements and a project lifecycle can be thought of across five phases: pre-permitting, pre-construction, pre-operation, injection, and post-injection, site care. When injection is complete, operators must comply with EPA's closure standards and propose a detailed plan to plug the UIC Class VI injection well(s).[43] Upon a showing of non-endangerment to any underground stores of drinking water (**USDW**), the facility may be decommissioned.[44] The UIC Class VI rules establish a default period of 50 years for post-injection monitoring, but "an alternative post-injection site care timeframe" may be "appropriate" if it "ensures non-endangerment of USDW."[45]

170. Once an owner or operator has met all regulatory requirements under the UIC Class VI rules and the EPA Director has approved site closure pursuant to 40 CFR § 146.93, the owner or operator will generally no longer be subject to enforcement under the SDWA. However, an owner or operator may be held liable for regulatory noncompliance under section 1423 of the SDWA for violating 40 CFR .§ 144.12, such as where an owner or operator provided erroneous data to support its site closure.[46]

171. Additionally, an owner or operator may always be subject to an order the Administrator deems necessary to protect the health of persons under section 1431 of the SDWA after site closure if there is fluid migration that causes or threatens imminent and substantial endangerment to a USDW.[47]

172. Furthermore, after site closure, an owner or operator may, depending on the fact scenario, remain liable under tort and other remedies, or under other Statutes including, but not limited to, Clean Air Act;[48] CERCLA;[49] and RCRA.[50]

173. Consequently from a potential liability perspective, there is also a sixth and final phase relating to post-closure and long-term care that may merit owner or operator consideration, which is generally not subject to the same level of financial or regulatory responsibility obligations.

174. A project's injection phase is generally anywhere from 10 to 20 years. Once the injection is complete, operators will plug the well and begin post-injection site care, including a period of modeling, testing, and

43 40 CFR § 146.92.
44 *id*.§ 146.93(b).
45 *id*.§ 146.93(c).
46 75 Fed. Reg. 77230, 77272 (Dec. 10. 2010).
47 75 Fed. Reg. at 77230.
48 42 U.S.C. §§ 7401-7671.
49 42 U.S.C. § 9601-9675.
50 42 U.S.C. 6901-6992. 75 Fed. Reg. at 77230.

monitoring to ensure secure storage for the long-term care phase (50 years or such period as required by an alternate EPA approved timeframe).

175. The SDWA requires that the current owner or operator of a Class VI well meet minimum financial responsibility requirements during well construction, injection and monitoring, well plugging and post-injection site care phases (see figure 1), including to cover any emergency and remedial response during that time. Financial assurances may include:

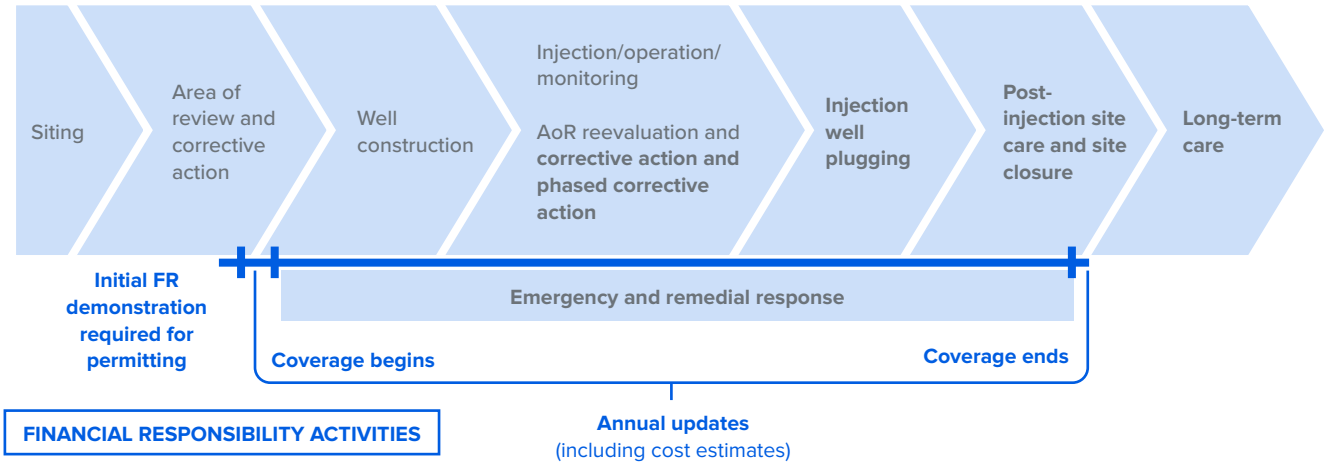
a. financial instruments (e.g. bonds, trust funds, insurance, letters of credit, financial fit tests, and, if necessary, parental guarantees) that owners or operators of Class VI wells can select to demonstrate financial responsibility, as well as the relative strengths and weaknesses associated with each instrument;

b. minimum specifications and protective conditions of financial coverage that owners or operators must use to demonstrate compliance with the Class VI requirements;

c. submission requirements for owners or operators demonstrating financial responsibility and review requirements for the UIC Program director; and

d. other ongoing financial responsibilities of the owners or operators of Class VI wells.

FIGURE 1. Geological Sequestration Financial Responsibility Timeline



176. The types of financial responsibility instruments that the EPA recommends depends on the type of geological sequestration activity but the financial responsibility instrument(s) used must be one or more of from the following list of qualifying instruments: trust funds, letters of credit, surety bonds, escrow accounts, self insurance (ie, financial tests and corporate guarantees), insurance and any other instrument(s) satisfactory to the Director.

177. The qualifying instrument(s) must be sufficient to cover the cost of: (i) corrective action (that meets the requirements of § 146.84); (ii) injection well plugging (that meets the requirements of § 146.92); (iii) post injection site care and site closure (that meets the requirements of § 146.93); and (iv) emergency and remedial response (that meets the requirements of § 146.94). The financial responsibility instrument(s) must be sufficient to address endangerment of underground sources of drinking water.[51]

51 40 C.F.R. § 146.85.

178. Unlike other classes of wells under the UIC Program, a permit for a Class VI well cannot be automatically transferred to a new owner or operator. Class VI wells used for injecting CO_2 for geological sequestration is expressly excluded from the automatic permit transfer process.[52] A change in ownership or operational control of a well where no other change to a permit is necessary may be processed via a minor modification (rather than full modification) of the permit. This requires a written agreement containing a specific date for transfer of permit responsibility, coverage, and allocation of liability between the current and new permittees being approved by the EPA.[53] If any other permit changes are required then the more robust full modification process must be followed, including draft permit approval and public notice requirements.

179. When transferring ownership of a well, any previous owner and operator will remain financially responsible and liable for closing, plugging and abandonment of the underground injection operation in a manner prescribed by the EPA until the previous owner and operator has received a notice from the EPA that the new owner and/or operator has demonstrated financial responsibility for the well.[54]

Post-closure liabilities

SNAPSHOT

Owner / operator are relieved from ongoing routine monitoring and maintenance requirements once the post-injection period is complete to the EPA's satisfaction. There is no mechanism under the UIC Program to allow the transfer of liability to the government following post-closure. The last owner / operator prior to post-closure will remain liable for damage.

180. Once the post-injection period is complete to the EPA's satisfaction, operators receive a project closure authorization or certificate. At this stage, the UIC Class VI rules provides for the return of financial assurances to the owner or operator (rarely, and only for trust funds and escrow accounts) or for the financial instruments (bonds, letters of credit and insurance) to terminate in accordance with the terms or at a specific date and relieves the owner and operator of ongoing routine monitoring and maintenance requirements.

181. Under current SDWA provisions, the EPA does not have unilateral authority to transfer liability from one private sector entity (i.e., owner or operator) to another or to the federal government or state.[55] If a state obtains its own primacy, this is something that can then be changed (see examples in the following sections). There may also be a policy change which could impact this decision at the federal level. The current presumption is that the then current owner and/or operator will therefore remain liable for damage to an underground source of drinking water which may arise in the future. If there has been a transfer of ownership (and permit) during the operating life of a well, the parties may have agreed to apportion the liability between themselves (subject to the EPA's approval at the time of such transfer).

182. At a state level, the programs adopted by Wyoming and Louisiana provide for limited liability releases that eliminate much of the potential long-term liabilities that could be associated with CO_2 storage. These state frameworks share the same general framework in that both states provide a timeline for assuming responsibility and liability for a CCS project's sequestered CO_2 once the injection of CO_2 stops by issuing

52 SDWA, § 144.38 Transfer of permits.
53 SDWA, § 144.41 Minor modifications of permits.
54 SDWA, § 144.52 Establishing permit conditions.
55 75 Fed. Reg. at 77230.

a certificate of completion. But the criteria upon which a certificate of completion will be issued, the timing and the types of legal liability assumed are unique to each state. North Dakota (which is outside the scope of the Selected Jurisdictions) has nearly identical criteria to Wyoming for issuing a certificate of completion, but unlike Wyoming, North Dakota also takes title to the stored CO_2 along with all associated responsibility post-closure.

Barriers to transfer

SNAPSHOT

The absence of the ability to transfer liability to the government post closure and inconsistency between states on approach to ownership of tenure and title remains the main barriers for proponents when considering a transfer of license.

183. A barrier to entry under the federal framework is that there is no federal regime to transfer liability to the federal government during the long-term care phase after remediation and site closure of a well site. This borrows from the oil and gas industry, with traditional regulatory and legal principles around liability designed to hold operators accountable when they or those for which they are responsible for fail to live up to their responsibilities. Such rules are intended to encourage operators to do as good and thorough a job as technically feasible. This does not seem to prevent investment in CCS in Texas, which had around 40 projects in the pipeline and awaiting EPA approval (one third of all US applicants) shortly before the time it was granted primacy in November 2025.

184. Issues of tenure and title, notably the ownership of the pore space, have also proven critical considerations for regulators in some jurisdictions. Clarity as to property interests in a storage site, is essential for operators seeking to acquire the necessary surface and subsurface rights for injecting and storing CO_2 in a target geological formation. While in many countries the geology of the subsurface is owned by the government, in the United States, subsurface ownership rights and associated liabilities can vary from state to state. Liability issues often arise if there is a transboundary migration of injected CO_2 within the subsurface that impacts the interests of the owners of other estates (e.g. the surface landowner).

185. While an owner and operator may no longer be subject to regulatory monitoring and financial requirements under the UIC Class VI rules upon approval and certification of site closure, there are circumstances for which the owner and operator may still be held liable for regulatory non-compliance even after site closure is approved. The EPA may issue an order that is deemed necessary to protect the health of persons under section 1431 of the SDWA if there is fluid migration that causes or threatens imminent and substantial endangerment to an underwater supply of drinking water.

186. The federal and state regulatory landscape is intertwined and complex when it comes to certain activities required by, or adjacent to, CCS depending on the type of activity and its location. The following are examples of some other US federal agencies and/or processes that are regulated and may cross over with specific types of CCS projects that have not been considered in detail for this version of the report:

    a. Prevention of Significant Deterioration and New Source Review (EPA);

    b. National Pollutant Discharge Elimination System (EPA);

c. Hazardous Liquid Pipeline Act (Department of Transportation, Pipeline and Hazardous Materials Safety Administration);

d. Clean Water Act, Section 404 (Department of Defense, US Army Corps of Engineers);

e. Endangered Species Act – private lands and federal lands (Department of Interior, U.S. Fish and Wildlife Service for land and freshwater species, Department of Commerce, NOAA Fisheries for Marine Species);

f. Rights-of-Way for pipelines through federal lands (DOI, Bureau of Land Management, Department of Agriculture, US Forest Service);

g. CO_2 pipeline safety (DOT);

h. Federal Land Policy and Management Act (DOI, Bureau of Land Management, DOA, US Forest Service);

i. National Forest Management Act (DOA, US Forest Service);

j. Mineral Leasing Act (DOI, Bureau of Land Management, DOA, US Forest Service);

k. National Environmental Policy Act (Council on Environmental Quality);

l. National Historic Preservation Act – federal lands (DOI) and private land (where there is a federal nexus);

m. Marine Protection, Research, and Sanctuaries Act (EPA); and

n. Outer Continental Shelf Lands Act (DOI, Bureau of Offshore Energy Management, Bureau of Safety and Environmental Enforcement).

United States of America – Wyoming

Issue	Comment	Risk
Existence and robustness of CCS regime	Comprehensive but untested liability regime	
Liability split between stakeholders	Liability regime focuses solely on existing license holder. Liability of former license holders will be pursuant to commercially agreed transfer agreements	
Post-closure liability	20 year minimum period after the end of CO_2 injection	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

187. In 2022, Wyoming was granted Class VI primacy by the EPA resulting in the Wyoming Department of Environmental Quality (**DEQ**) taking over primary regulatory responsibility relating to Class VI wells. To obtain Class VI primacy, the EPA assesses any state liability transfer provisions, which must be appropriately drafted so that a state's Class VI program meets UIC federal regulatory requirements.

188. Set out below is a list of some of the key CCS related frameworks and Wyoming's legislative status (where applicable) in connection with each:

a. CCS Framework(s): the Wyoming Environmental Quality Act under the Wyoming Statutes, Title 35, Chapter 11 (**EQ Act**) and Wyoming DEQ Water Quality Division Regulations, Chapter 24 (**Chapter 24 Regulations**) provide the overarching framework for environmental protection in Wyoming, including the regulation of Class VI wells and geological sequestration of CO_2 pursuant to Wyoming obtaining Class VI primacy.

b. Ownership of Injected CO_2: the EQ Act established that the permit holder (referred to as the **injector**) retains ownership of the injected CO_2 until a certificate of completion is issued. During any time, the injector holds title to carbon dioxide under this section, the injector shall be liable for any damage the injected or stored CO_2 may cause, including damage caused by CO_2 that escapes or is released from where it is being stored underground.[56]

c. Monitoring and Reporting: The Wyoming DEQ sets forth injected volume monitoring and reporting requirements in its Chapter 24 Regulations.[57]

d. Pore Space Ownership: the EQ Act codified pore space ownership, which follows the American Rule and is vested with the surface owner.[58]

56 Wyo. Stat. Ann. § 35-11-318.
57 Ch. 24, § 20.
58 Wyo. Stat. Ann. § 34-1-152.

e. Pore Space Unitization: in Wyoming, the DEQ has the power to order unitization for geologic carbon storage for the purpose of maximizing the storage capacity and ensuring the safe containment of CO_2.[59]

f. Subsurface Trespass: Wyoming courts have recognized a cause of action for subsurface trespass and have observed that an injection permit or approval of an administrative unit is not a defence against subsurface trespass or resulting conversion.[60]

g. Eminent Domain: Wyoming may permit the use of eminent domain to site a pipeline carrying carbon dioxide only where it is established that the public interest and necessity require the project or the use of eminent domain is authorized by the Wyoming Constitution, the project is planned or located in the manner that will be most compatible with the greatest public good and the least private injury; and the property sought to be acquired is necessary for the project.[61]

h. Administrative Agency: the Wyoming DEQ oversees Wyoming's Class VI permitting process. The Wyoming Oil and Gas Conservation Commission oversees unitization for geologic storage projects.[62]

SNAPSHOT

A failure to obtain sufficient pore space rights may result in a potential trespass or nuisance claim if injected CO_2 travels into pore space in which the operator has not secured pore space rights. An additional issue that may arise when acquiring pore space involves surface owners who cannot be located or holdout owners who refuse to provide the project with rights in their pore space. Similar to unitization or pooling in the oil and gas context, statutorily required amalgamation or integration of holdout pore space has been put in place for CCS projects in some states, including Wyoming.

Transfer liabilities

189. The EQ Act explicitly references certain types of liabilities associated with Class VI well operations, including:

a. Financial responsibility: similar to the federal requirements, there is a requirement for injectors to (i) demonstrate financial responsibility to cover the costs of well construction, operation, monitoring, and closure; and (ii) provides details on financial assurance instruments required, such as bonds and insurance.[63]

b. Environmental protection and damage: injectors are liable for any environmental damage resulting from the operation of Class VI wells, including remediation and restoration of affected areas, as well as penalties for violations of environmental regulations. They are also required to comply with EQ Act provisions for the prevention of contamination and the safe management of injected CO_2.

59 Wyo. Stat. Ann. §§ 35-11-313 - 35-11-317; Wyo. Code R. § 55-3-43.
60 ANR Prod. Co. v. Kerr-McGee Corp., 893 P.2d 698 (Wyo. 1995).
61 Wyo. Stat. Ann. § 1-26-814.
62 85 Fed. Reg. 64053 (2020); Wyo. Stat. Ann. §§ 3 add5-11-313; 35-11-315.
63 Wyo. Stat. Ann. §§ 35-11-313.

c. Monitoring and reporting: injectors are required to implement monitoring and reporting programs to ensure the integrity of the storage formation and the containment of injected CO_2, as well as mandating regular submission of monitoring data to the Wyoming DEQ.[64]

d. Permitting and compliance: permit requirements for Class VI wells include the submission of detailed project plans, site characterization, and construction standards. The EQ Act ensures that operators comply with all regulatory requirements before commencing well operations. The types of DEQ enforcement mechanisms, include inspections, penalties, and corrective actions for non-compliance with permit conditions and regulatory standards.

190. Any transfer of ownership of Class VI wells and the associated liabilities requires DEQ approval to ensure that the new owner meets all financial and technical qualifications to manage the well responsibly.[65] Unlike some other states, Wyoming also allows for the severance of the pore space from the surface estate and separate transference. If severed, pore space ownership can be transferred in the same manner as the mineral estate.

191. If unitization of CO_2 storage is approved by the DEQ, a unit agreement must be established, outlining the terms and conditions for the collective management of the carbon storage reservoir. This agreement includes provisions for the allocation of storage capacity, the responsibilities of each stakeholder, and the procedures for monitoring and reporting. The unit agreement must also demonstrate that the operators have the financial resources to cover the costs of well construction, operation, monitoring, and eventual closure. This ensures that the unitized project can be managed sustainably and safely. Any transfer of a unit agreement must be approved by the Wyoming DEQ. The transfer process ensures that the new party meets all regulatory requirements and is capable of managing the unitized project. The current holder of the unit agreement must submit an application to the DEQ for the transfer. This application should include detailed information about the proposed transferee, including their technical and financial capabilities to manage the carbon storage project. A transfer agreement between any outgoing transferor and an incoming transferee should clearly outline the terms of the transfer, including ongoing liabilities of the transferor (if any).

Post-closure liabilities

SNAPSHOT

It is not clear what potential exposure and liabilities remain with the injector of CO_2 (ie, either the owner or operator of the Class VI well, whichever is the permit holder) transferring title to the CO_2 to the State upon being provided a certificate of completion. The EQ Act is carefully drafted: (i) it only releases the injector from regulatory requirements, and not for example, tortious or other liabilities; (ii) it is clear that only 'primary' responsibility and liability is transferred to the State and; (iii) the State's liability is capped to the amount in the Wyoming's Geologic Sequestration Special Revenue Account.

192. Injectors remain liable for injected CO_2 for so long as the injector holds title to the CO_2. The injector can transfer title and (subject to the below limitation) liability to the State of Wyoming upon receiving a certificate of completion. There is a 20-year minimum period after the end of CO_2 injection before a certificate will be issued.[66]

64 Wyo. Stat. Ann. §§ 35-11-302 – 303, 306.
65 Wyo. Stat. Ann. §§ 35-11-307.
66 Wyo. Stat. Ann. § 35-11-319.

193. Wyoming requires that upon the issuance of a certificate of completion, in exchange for assuming primary responsibility and certain liabilities for the stored CO_2 (see below), title to the stored or injected CO_2, and any facilities used to inject or store the CO_2, without payment of any compensation, shall also be transferred to the State. As noted in further detail, the transfer of liability to the State is limited to the amount accrued in the Wyoming Geologic Sequestration Special Revenue Account.[67] It is not explicitly stated and therefore unclear whether the state's liability cap would mean all such liability is capped (both for the state and the operator) at the amount in the special revenue account or whether the cap would only apply to the state's liability and the operator could still be liable for damages in excess of the cap.

194. The EQ Act does not explicitly define "primary responsibility" and it is carefully drafted not to explicitly state that all responsibilities and liabilities are assumed by the state. The EQ Act includes for example the following provisions:

a. title acquired by the state includes all rights, and interests in, and all responsibilities associated with, the stored or injected CO_2;[68]

b. primary responsibility and liability for the stored or injected CO_2 shall be transferred to the state, provided that liability to the state shall not result in the payment of any damages in excess of the balance of the Wyoming geologic sequestration special revenue account;

c. the injector and all persons who generated any injected or stored CO_2 shall be forever released from all regulatory requirements associated with the continued storage and maintenance of the injected CO_2;

d. any bond or financial assurance submitted to the department shall be released; and

e. the state, through the department, shall assume responsibility to manage and monitor the stored CO_2 until such time when the federal government assumes responsibility for the long-term monitoring and management of stored CO_2.

Barriers to transfer

195. Wyoming will issue a certificate of completion to the injector only if the following conditions are met:

a. it is in full compliance will all laws governing the CCS project;

b. it has addressed any pending claims regarding the project's injection and sequestration;

c. the CCS project's storage or pore space is not expected to expand vertically or horizontally or pose a threat to human health, safety, the environment, or underground sources of drinking water;

d. the stored CO_2 is unlikely to migrate outside of its stored boundary;

e. all wells and facilities used to maintain and monitor the sequestered CO_2 are in good condition and will maintain mechanical integrity; and

f. injection wells required to have been plugged have been plugged.

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67 Wyo. Stat. 35-11-320(a).
68 Wyo. Stat. 35-11-319.

196. It is unclear whether Wyoming's liability cap is intended to limit the amount a third party can claim from any party involved in the CCS project – both for the State and the injector - or whether the cap would only apply to the State's liability, with the injector still liable for certain damages in excess of the cap. The fact that the EQ Act only refers to 'primary' liability for the stored CO_2 transferring to the state and releasing the operator only from regulatory requirements, may infer that at least some liability for certain losses may remain with the operator.

United States of America – Louisiana

Issue	Comment	Risk
Existence and robustness of CCS regime	Nascent but comprehensive liability regime. Untested given its recency, but has obtained primacy from the Federal Class VI Rule	
Liability split between stakeholders	Regime clearly delineates liability between various proponents however no express discussion on transfer liability between previous petroleum license holder and existing CCS holder	
Post-closure liability	50 year monitoring period	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

197. In 2024, Louisiana was granted Class VI primacy, with the Louisiana Department of Natural Resources (**LDNR**) having primary regulatory responsibility for Class VI wells.

198. In October 2025, the Governor of Louisiana issued an executive order placing a moratorium on new applications for Class VI injection wells. The order aims to suspend consideration of new Class VI applications to "provide a clear roadmap for citizens and local officials" following a review of safety, siting, and public engagement standards, ensuring that local communities are adequately informed and that state oversight is strengthened before further expansion of the CCS industry. The moratorium does not have a specified end date.

199. Set out below is a list of some of the key CCS related frameworks and Louisiana's legislative status (where applicable) in connection with each:

    a. CCS Framework(s): Louisiana's Geologic Sequestration of Carbon Dioxide Act (**GSCD Act**)[69] was amended in contemplation of Louisiana obtaining Class VI primacy. To address liability concerns and encourage adoption of CCS, the Act also creates the Carbon Dioxide Geologic Storage Trust Fund, which is funded by fees paid by a Class VI well operator during the project.

    b. Ownership of Injected CO_2: all CO_2 which is injected into a storage reservoir is deemed the property of the party that owns such CO_2, whether at the time of injection or pursuant to a change of ownership by agreement and is not, for example, owned by the surface or mineral owner (owner in interest) of the lands in or adjacent to the storage reservoir. An operator and owner are separately defined, although the storage operator can, but need not be, the owner of CO_2 injected into a storage facility (and vice versa). Ownership of CO_2 and use of geologic storage is a matter of private contract between the operator of a well, owner of a well, owner of the CO_2 and owner of the surface land and/or mineral owner. The issuance of a permit does not convey any property rights of any sort.

69 Louisiana Revised Statutes, Title 30. Minerals, Oil, and Gas and Environmental Quality, Subtitle I. Minerals, Oil, and Gas, Chapter 11. Louisiana Geologic Sequestration of Carbon Dioxide Act (§1101-1115).

c. Monitoring and Reporting: Class VI well reporting and monitoring duties will be allocated to the Office of Conservation, which will require operators to (i) submit monthly injected volume reports and (ii) implement continuous recording devices to monitor injection volumes.

d. Pore Space Ownership: Louisiana case law appears to follow the proposition that the surface owner also owns title to the subsurface.[70] Pore space ownership for carbon capture purposes has not been directly addressed by the GSCD Act or jurisprudence. However, Louisiana Civil Code article 490 provides that unless otherwise provided by law, the ownership of a tract of land carries with it the ownership of everything that is directly above or under it.

e. Pore Space Unitization: although the GSCD Act did not address the issue, a subsequent piece of legislation in 2024 (HB 966) grants the Commissioner powers to unitize, pool, and consolidate all separately owned tracts within a unit for geologic storage in order to facilitate an orderly development of the state's geologic storage resources and prevent waste. The procedures adopted follow a similar system that is in place for Louisiana oil and gas projects. To apply for an order for unit operation, three-fourths of the owners in interest within the proposed unit must have consented in writing. The order must also provide for just and equitable compensation to all owners in interest, including the storage operators and landowners, whether they have consented or not to such operations. In March 2025, a subsequent bill (HB 632) was introduced (but not yet enacted) which would further amend the GSCD Act[71] as it applies to unitization, requiring both the surface and mineral owner of a tract to approve to be counted toward the three-fourths consent requirement.

f. Subsurface Trespass: Louisiana case law on trespass generally recognizes the landowner's ownership of the subsurface and the Louisiana Supreme Court has considered subsurface trespass actions on several occasions.[72]

g. Administrative Agency: LDNR, through its office of Conservation, is responsible for issuing Class VI well permits and the administration of the UIC Program in Louisiana. The Commissioner of Conservation regulates the development and operation of storage facilities and pipelines transmitting CO_2 to storage facilities.[73]

h. Eminent Domain: The GSCD Act previously set forth eminent domain laws for operation and transportation of CO_2 to storage facilities,[74] which were later extinguished in August 2024 by subsequent legislation (HB 492).

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70 Boudreaux v. Jefferson Island Storage & Hub, 255 F.3d 271 (5th Cir. 2001); Nunez v. Wainoco Oil & Gas Co., 488 So. 2d 955 (La. 1986); Gliptis v. Fifteen Oil Co., 204 La. 896, 904 (1944); Keith B. Hall, Hydraulic Fracturing: If Fractures Cross Property Lines, Is There an Actionable Subsurface Trespass, 54 Nat. Resources J. 361 (2014).

71 §30.1104.2.

72 Gliptis v. Fifteen Oil Co., 204 La. 896, 904 (1944); Boudreaux v. Jefferson Island Storage & Hub, 255 F.3d 271 (5th Cir. 2001); Nunez v. Wainoco Oil & Gas Co., 488 So. 2d 955 (La. 1986).

73 La. Rev. Stat. Ann. § 30:1104.

74 La. Rev. Stat. §§ 30:1108; 19:2.2; 19:2.1.

Transfer liabilities

SNAPSHOT

The GSCD Act clearly delineates liability between previous and current owners and operators of a CCS license. The existing license holder is liable for the day-to-day activities and will be subject to any remedial obligations. Absent of any agreement otherwise, the previous license holder will be released from all liability upon transfer where it provides sufficient funds to cover long-term costs. Transfer liability must also be detailed within a transfer instrument approved by the commissioner.

200. The GSCD Act distinguishes between a previous and current owner and operators in a number of ways. Prior to a transfer of a CO_2 storage facility to the state, for example, it is the owner and last operator of record that is responsible for addressing or remediating any duty, obligation, or liability that may arise after issuance of the certificate of completion of injection operations if there are inadequate funds in the state's CO_2 trust fund to cover them. A previous owner and operator can also ensure it is released from all liability if it transfers the site to another owner and operator and they establish a specific trust fund which has sufficient funds to cover future long-term maintenance, monitoring, and site closure or remediation of that storage facility site and it is approved by the commissioner.

201. A permit may be transferred to a new owner or operator upon approval by the commissioner. The application shall contain a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between them. The agreement should also demonstrate to the satisfaction of the commissioner that the relevant financial responsibility requirements will be met by the new permittee. The agreement should clearly set out the liability regime between the parties, including who is liable for liabilities caused before but only identified after transfer. If no agreement described is provided (or if the agreement does not adequately or clearly allocate responsibility to the existing permit holder), responsibility for compliance with the terms and conditions of the permit and liability for any violation will shift from the existing permittee to the new permittee on the date the transfer is approved. If a person attempting to acquire a permit causes or allows operation of the facility before approval by the commissioner, it shall be considered a violation of the state's Class VI rules for operating without a permit or other authorization.

202. If a storage facility site is transferred from one party to another (other than to the state) the parties may elect to establish a site-specific trust account for the purpose of providing a source of funds for long-term maintenance, monitoring, and site closure or remediation of that storage facility site. Once the commissioner has approved the site-specific trust account, and the account is fully funded to cover long-term costs, the party transferring the storage facility site and all prior owners, operators, and working interest owners shall not thereafter be held liable by the state for any site closure costs or actions associated with the transferred storage facility site. The party acquiring the storage facility site shall thereafter be the responsible party. The parties to a transfer may elect not to establish a site-specific trust account; however, in the absence of such account, the parties shall not be exempt from liability.

203. Upon any conveyance of a Class VI well, each owner or operator must include a notation on the deed indicating the volume of fluid injected, the injection zone or zones into which it was injected, and the period over which injection occurred.

Post-closure liabilities

SNAPSHOT

Owner/operator will be liable for remedial and monitoring liability for a minimum of 50 years (or such timeframe otherwise established on a site-specific basis) and will be released of all liability associated with the storage site upon obtaining a certificate of completion. Liability will not be released where insufficient funds remain in the Carbon Dioxide Geologic Storage Trust Fund (whether due to past withdrawals or an underestimate of required contributions).

204. Once an operator has ceased injection of CO_2 into a storage facility, the owner and operator remain responsible for that site for 50 years or such other timeframe established on a site-specific basis. If the LDNR is satisfied after such period, the commissioner will issue a certificate of completion of injection operations. The certificate includes the following requirements:

    a. the reservoir is reasonably expected to retain mechanical integrity;

    b. the carbon dioxide will reasonably remain emplaced;

    c. the storage facility does not pose an endangerment to underground sources of drinking water, or the health and safety of the public;

    d. the current storage operator has complied with all applicable regulations related to post-injection monitoring and the issuance of the certificate of completion of injection operations; and

    e. the storage facility has been closed in accordance with all applicable regulations related to site closure.

205. Upon the issuance of the certificate (ie, 50 years after injection ceased), the ownership of the project and the stored CO_2 becomes the responsibility of the State of Louisiana and (subject to two main limitations) the storage operator, all generators of any injected CO_2, all owners of CO_2 stored in the storage facility, and all owners otherwise having any interest in the storage facility are released from:

    a. any and all duties or obligations they may have had under the GSCD Act; and

    b. any and all liability associated with or related to that storage facility which arises after the issuance of the certificate of completion of injection operations.[75]

206. A limitation to the transfer of ownership and release of liability is that owners and operators are not released from duties or obligations that arise from any non-compliance with UIC laws and regulations prior to the issuance of the certificate of completion.

207. Another limitation is that the release of liability does not apply if at any time the Carbon Dioxide Geologic Storage Trust Fund contains inadequate funds (whether due to past withdrawals or an underestimate of required contributions) to address or remediate any duty, obligation, or liability that arises for that site. As noted above, this will result in the owner and last operator of record prior to the transfer to the state retaining ongoing exposure to potential liability for a shortfall in the state's trust fund.

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75 LA Rev Stat § 30:1109.

208. The GSCD Act does cap non-economic compensatory damages - regardless of the trust fund amount – brought against the owner or operator. In any civil liability action against the owner or operator, the maximum amount recoverable as compensatory damages for non-economic loss is $250,000 per person, unless the damages were for wrongful death or injury, in which case the maximum is $500,000 per person (prior to August 2024 these were per occurrence rather than per person). If such limits are found to be unconstitutional or invalid, the maximum amount is $1,000,000 per person.

Barriers to transfer

SNAPSHOT

The lengthy EPA Class VI well permit approval process remains a barrier to applying for CCS permits and it is likely to be a similar lengthy process to apply under LDNR oversight in Louisiana. Once a permit is obtained, the transfer of an existing Class VI well permit from one owner to another also requires commissioner approval and a similar approval process to that used when obtaining an initial permit.

209. Despite the strong demand for Class VI wells, the industry's growth has been constrained due to a Class VI permitting backlog, with some permits taking as long as six years for approval. Approximately one third of all EPA pending permit applications before the EPA were related to projects in Louisiana. Now that Louisiana has obtained primacy over Class VI wells, all of the Louisiana pending permits have been transferred to the LDNR for review. This could speed up the permitting process however the LDNR website FAQs indicate that a simple application with one round and no LDNR questions or requests for further information would be expected to take 18 months. An application as complex as a Class VI permit is expected to take several rounds between the applicant and LDNR. Once the permit is in draft form, LDNR is also required to have a minimum 30 day period for public comment, including a locally-held public hearing. Any transfer of a permit is also handled by the LDNR and requires a similar process to obtaining a new permit. Given Louisiana has only recently obtained primacy and has few operational Class VI wells it is not yet clear how long the approval process will be for transferring permits between owners.

210. Similar to its Class V (test well) permitting process, Louisiana has introduced specific, and in some cases more onerous elements to its Class VI permit process compared to those required by the EPA other states that may slow the process, for example:

    a. Louisiana mandates that each individual Class VI well undergoes a separate review and permitting process. This approach differs from the EPA's practice of issuing permits for multiple wells within a given project simultaneously.

    b. The state explicitly prohibits the sequestration of CO_2 in salt caverns, a restriction not present in the EPA's requirements.

    c. Louisiana does not grant waivers to injection depth requirements for Class VI wells and imposes additional monitoring systems and operating requirements beyond those mandated by the EPA, emphasizing a stringent adherence to safety measures. In contrast, the EPA may consider waivers under certain circumstances.

    d. Under the state's Class VI rule, the operator must immediately cease injection into a well upon receipt of written notice from the commissioner. The well shall remain out of injection service until such time as well mechanical integrity is restored to the satisfaction of the commissioner.

e. Louisiana's Class VI program incorporates Environmental Justice analysis, a distinctive feature intertwining safety and environmental considerations. A comprehensive analysis of Environmental Justice impacts on communities during the permitting process is conducted. This includes identifying environmental hazards, potential exposure pathways, and susceptible populations.

f. The state implements measures to protect residential areas, potentially including the establishment of CO_2 monitoring and release notification networks, along with enhanced pollution controls. An owner or operator of a Class VI well shall provide quarterly reports to LDNR concerning changes to characteristics of the CO_2 stream, monthly average maximum and minimum injection pressure, flow rate and volume, and volume injected. If these types of environmental requirements are not present in other states, it may make owning and operating a well in Louisiana less attractive.

United States of America – Texas

Issue	Comment	Risk
Existence and robustness of CCS regime	Nascent liability regime, with gaps and points of uncertainty. Only partially tested. Has recently obtained primacy from the Federal Class VI Rule	
Liability split between stakeholders	Liability regime focuses solely on existing license holder. Upon transfer, previous license holder is relieved of liability	
Post-closure liability	50 year post injection site care period	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

211. Texas was granted Class VI primacy in 2025.

212. Texas has put in place its own state level CCS framework for CO_2 reservoirs. A person may not begin drilling or operating a CCS injection well, or construct or operate a geologic storage facility, in Texas without first obtaining the necessary permits from both the EPA (modified since the grant of Class VI primacy in November 2025) and the relevant Texas regulatory body. However, certain gaps exist in the current law, including failing to address pore space ownership and long-term liability associated with CO_2 injection:

    a. CCS Framework(s): In June 2021, Texas enacted House Bill 1284, which was incorporated into Chapter 5 (Carbon Dioxide) of Title 16 of the Administrative Code (**Chapter 5**),[76] consolidating the state's jurisdiction for CCS and related Class VI wells under the Railroad Commission of Texas (**RRC**). This did not remove any jurisdiction of the EPA and the UIC Class VI rules. Much of Chapter 5 duplicates elements of the federal requirements, in anticipation of Texas obtaining its own Class IV primacy (which has only recently occurred). In addition to the relatively new Chapter 5, it is also worth noting there some more established principles regarding CO_2 ownership as set out in Chapter 121 (Ownership and Stewardship of Anthropogenic Carbon Dioxide) of Title 3 of the Natural Resources Code (**Chapter 121**).[77]

    b. Ownership of Injected CO_2: Although Chapter 5 is silent, Chapter 121 states that stored CO_2 is the property of the operator. Beyond Chapter 121, there is precedent in Texas for gas stored in underground storage facilities to remain the injectors' personal property.[78]

    c. Monitoring and Reporting: The RRC requires a semi-annual report containing the volume injected into each Class VI well.

76 Texas Administrative Code, Title 16, Part 1, Chapter 5 (Carbon Dioxide), Subchapter B, Subchapter B. Geologic Storage and Associated Injection of Anthropogenic Carbon Dioxide (CO_2), Rule §5.201 - §5.208.

77 Natural Resources Code, Title 3. Oil and Gas, Subtitle D. Regulation of Specific Businesses and Occupations, Chapter 121. Ownership and Stewardship of Anthropogenic Carbon Dioxide (§121.001 - 121.004).

78 Lone Star Gas Co. v. Murchison.

d. Pore Space Ownership and Unitization: Texas has not adopted legislation that directly addresses the question of pore space access specifically for CCS, but recently the Texas Supreme Court has held that "the surface owner, and not the mineral lessee, owns the possessory rights to the space under the property's surface".[79] The case itself did not specifically involve CO_2 sequestration (but salt caverns) and there is no compulsory CO_2-specific unitization legislation in Texas.

e. Subsurface Trespass: Both surface landowners and mineral owners or lessees may bring subsurface trespass claims. A subsurface trespass claim requires a demonstration of actual injury; simple drainage of oil and gas from fracturing does not constitute actionable injury. The parameters of subsurface trespass remain unsettled in Texas. In this regard, CO_2 that is injected in one location and then migrates through the subsurface to another location can potentially constitute trespass, at least where the injector has not obtained appropriate rights to the subsurface from the owners of the relevant property rights.[80]

f. Administrative Agency: The EPA, up to the date of the grant of primacy, and the RRC of Texas oversee CCS regulation in Texas.

Transfer liabilities

SNAPSHOT

The existing owner or operator will be liable for the day-to-day CCS activities, any corrective action and remedial and post closure requirements. Upon transfer of license, the previous license holder will be relieved of its liability.

213. When a geologic storage facility is owned by one person but is operated by another person, it is the operator's duty to comply with the requirements of Chapter 5 regarding the permitting, physical operation, closure, and post-closure care of a geologic storage facility, except that either the owner or the operator may demonstrate financial responsibility. The owner relates to ownership of any facility or activity subject to regulation under the UIC Program.

214. Chapter 5 does not directly address ownership of CO_2; however, Texas has not changed its liability rules surrounding the injection and storage of CO_2. Chapter 121 states that stored CO_2 is the property of the storage operator, the storage operator's heirs, successors, or assigns. It allows for exceptions to this general ownership rule, for example if it is otherwise expressly provided by contract, bill of sale, deed, mortgage, deed of trust, or other legally binding document.

215. An owner or operator must demonstrate to the RRC on annual basis that it is able to maintain financial responsibility for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the RRC has provided written verification that the facility has reached the end of the post-injection storage facility care period. The RRC will rely on the annual audited accounts and/or most recent quarterly report, as well a bond or letter of credit an amount to be approved by the RRC.

79 Myers-Woodward, LLC v. Underground Services Markham, LLC, 2025 WL 1415892.
80 See Lightning Oil Co. v. Anadarko E&P Onshore, LLC, 520 S.W.3d 39 (Tex. 2017).

216. An operator may transfer its permit to another operator if the requirements of Chapter 5 are met. An operator remains responsible for the geologic storage facility until the RRC approves in writing the sale, assignment, transfer, lease, conveyance, exchange, or other disposition and the person acquiring the storage facility complies with all applicable requirements. The incoming operator must provide the RRC with satisfactory evidence of financial responsibility.

217. Prior to closing, the operator must demonstrate no additional monitoring is needed to assure the storage facility will not endanger USDWs, including:

    a. the estimated magnitude and extent of the facility footprint (the CO_2 plume and the area of elevated pressure);

    b. that there is no leakage of either CO_2 or displaced formation fluids that will endanger USDWs;

    c. that the injected or displaced fluids are not expected to migrate in the future in a manner that encounters a potential leakage pathway into USDWs;

    d. that the injection wells at the site completed into or through the injection zone or confining zone will be plugged and abandoned in accordance with these requirements; and

    e. any remaining facility monitoring wells will be properly plugged or are being managed by a person and in a manner approved by the director.

Post-closure liabilities

SNAPSHOT

Similar to the federal approach, there is no mechanism to allow a license holder to transfer its liability to the Government post-closure of the CCS site.

218. Upon completion of the requirements regarding authorization for closure set out in Chapter 5, the RRC will issue a certificate of closure. At that time, the operator is released from the requirement in §5.205(c) of Chapter 5 to maintain financial assurance. There is a 120-day notice period before a storage facility can be closed.

219. Similar to the federal requirements, Chapter 5 is silent in relation to any transfer of long-term liability to the State of Texas or any release of liability for the owner or operator. Permits issued under Chapter 5 are issued for the operating life of the facility and the post-injection storage facility care period. It remains the operator's responsibility to comply with the rules regarding closure and post-closure care.

220. The operator must record a notation on the deed to the facility property normally examined during title search that will in perpetuity provide any potential purchaser of the property the following information:

    a. a complete legal description of the affected property;

    b. that land has been used to geologically store CO_2;

    c. that the survey plan has been filed with the Commission;

d. (prior to primacy being granted) the address of the office of the EPA, to which the operator sent a copy of the survey plan; and

e. the volume and mass of fluid injected, the injection zone or zones into which it was injected, and the period over which injection occurred.

221. The operator must identify each location at which geologic storage activities take place, including each injection well, by a sign that meets the requirements of Chapter 5 (relating to identification of properties, wells, and tanks). In addition, each sign must include a telephone number where the operator or a representative of the operator can be reached 24 hours a day, seven days a week in the event of an emergency.

222. Chapter 121 provides that the state may take over long-term monitoring, verification, remediating mechanical problems, repairing mechanical leaks, plugging abandoned wells, and various training and compliance activities through the use of an Anthropogenic Carbon Dioxide Storage Trust Fund, but this is an issue of stewardship, not liability. Consequently, while operators are not responsible for monitoring of the facility after regulatory closure, the operator will remain liable for any issues that arise post-closure other than those listed.[81]

Barriers to transfer

SNAPSHOT

There are various legislative barriers to transfer a CCS license, such as environmental factors that must be considered prior to issuing / transferring a license. Until recently, the lack of clarity of pore space rights was also a further barrier to transfer but we now expect this to no longer be the case.

223. The RRC may not issue a permit until issuance of a letter of determination that drilling and operating the CO_2 injection well will not injure freshwater strata and the utilized formation is not freshwater sand.[82] To make this determination, the RRC reviews the relevant area corrective action plans, subsurface monitoring plans required during injection or post injection, post injection site care plans and any other elements of the application reasonably required for the RRC to make the determination.

224. Until May 2025, the lack of clarity on pore space rights had added inefficiency to CCS project planning in Texas, potentially requiring developers to acquire both surface and mineral estate properties to avoid legal claims. The finding of the Supreme Court of Texas in Myers-Woodward, LLC v. Underground Services Markham clarifies that Texas follows the American Rule. Absent an agreement otherwise, the Supreme Court of Texas has held that "the surface owner, and not the mineral lessee, owns the possessory rights to the space under the property's surface." Application of the judgement should still be done with caution (particularly as it involved salt caverns and not specifically CO_2), noting that "[n]ot all mineral estates are created equal. Resolving a dispute over the scope of a mineral conveyance should therefore begin with the text of the conveyance – not with generalizations about the default nature of a 'surface estate' or a 'mineral estate". It is likely that this finding will help provide more certainty to those considering CCS activities in Texas.

81 See Tex. Nat. Res. Code §121.003(d).
82 Tex. Water Code Ann. § 27.046(a).

United States of America – California

Issue	Comment	Risk
Existence and robustness of CCS regime	Subject to the implementation of SB 905, the federal liability regime will apply	
Liability split between stakeholders	Subject to the implementation of SB 905, the federal liability regime will apply. Liability regime focuses solely on existing license holder. Liability of former license holders will be pursuant to commercially agreed transfer agreements	
Post-closure liability	50 year post injection site care period	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

225. California has not been granted and is not seeking Class VI primacy; therefore, the federal requirements apply, with the EPA having regulatory jurisdiction (see paragraphs 169 to 182 above).

226. Set out below is a list of some of the other key CCS related frameworks and California's legislative status (where applicable) in connection with each:

    a. Framework(s) for CCS Activities: California Senate Bill 905[83], passed in September 2022 (**SB 905**) enables the implementation of the Carbon Capture, Removal, Utilization, and Storage Program within the California Air Resources Board (**CARB**). The program is not yet established, with CARB required to adopt regulations to implement the program, including a unified permit application process, details of the financial responsibilities of operators (for at least 100 years post-injection) and the allocation of legal liability between parties.

    b. Ownership of Injected CO_2: while California SB 905 does not directly address this issue, it seems likely that state agencies may allocate ownership of injected CO_2 as part of the regulations required by SB 905, for example in connection with pore space ownership and utilization.

    c. Monitoring and Reporting: SB 905 requires CARB and the California Natural Resources Agency (**CNRA**) to develop monitoring and reporting schedules for CO_2 capture, removal, or sequestration projects to ensure efficacy, safety, and viability of the projects.[84]

    d. Pore Space Ownership: SB 905 vests pore space ownership with the surface owner by default. However, title to pore space may be severed and separately conveyed. Any such transfers must describe the scope of the grantee's right to use the surface estate, describe the potential location of any geologic storage reservoirs, and include an allocation of liability from the surface estate owner to the pore space owner.[85] The ability to sever the pore space from the surface does not change the

83 Cal. Pub. Res. Code § 71461(a). Cal. S.B. 905 (2022).
84 Cal. Pub. Res. Code § § 39741.1 BREAK; § 71462 (e); § 3132(b).
85 Cal. S.B. 905 (2022).

fact that the allocation of legal liability between parties relating to CO_2 still needs to be agreed (see above at paragraphs (a) and (b)). Severance will however result in an extra party that a proposed operator must notify of a proposed project and involve in relevant agreements.

e. Pore Space Unitization: SB 905 requires a legal framework to be established for agreements regarding two or more tracts of land overlying the same geologic storage reservoir or reservoirs for purposes of managing, developing, and operating a CO_2 capture, removal, or sequestration project. A state agency would oversee such agreements, creating a landowner consensus requirement for approving agreements (i.e., similar to Louisiana, in that agreement proponents must own title to at least an undivided three-fourths of the total interests subject to the proposed agreement) and develop standards for allocating royalty payments.[86]

f. Subsurface Trespass: the California Geologic Energy Management Division (**CalGEM**) regulations provide that an underground injection project shall not cause or contribute to the migration of fluid outside the approved injection zone.[87] California case law also recognizes a cause of action for subsurface trespass.[88]

g. Administrative Agency: The California Air Resources Board and California Natural Resources Agency are responsible for developing the program authorised by SB 905. The California Geologic Energy Management Division oversees CCS related activities in California, including pipeline siting. Pursuant to SB 905, CO_2 pipelines shall be permitted for CCS only once the federal Pipeline and Hazardous Materials Safety Administration has concluded the rulemaking regarding minimum federal safety standards for transportation of CO_2 by pipeline.[89]

h. Eminent Domain: California does not appear to have eminent domain provisions specifically addressing CO_2 pipelines or underground storage. Such legislation is likely to develop under the auspices of SB 905, which requires state agencies to propose CO_2 pipeline siting standards.[90]

Transfer liabilities

SNAPSHOT

SB 905 will include a regime surrounding transfer of liabilities, however until its implementation, transfer of liability will be equivalent to the federal regime.

227. SB 905 requires the CNRA to consult with CARB to develop standards for the allocation of liability related to the geologic storage reservoir, and associated injection wells.

228. The standards will include a regime regarding the transfer of liability of a surface landowner who has sold or leased all interests in the geologic storage reservoir to a CO_2 sequestration project operator.

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86 Cal. S.B. 905 (2022).

87 See https://www.law.cornell.edu/regulations/california/14-CCR-1724.8.

88 Cassinos v. Union Oil Co., 14 Cal. App. 4th 1770, 1778 (1993), See ("causing subsurface migration of fluids into a mineral estate without consent constitutes a trespass"); Union Oil Co. v. Domengeaux, 86 P2d 127 (1939) and Hancock Oil Co. v. Meeker-Garner Oil Co., 257 P.2d 988 (Cal. Dist. Ct. App. 1958) (both recognizing that a subsurface trespass, through an oil well being drilled from one tract of land at such an angle that it was bottomed upon an adjoining tract, was a continuing trespass, and ordering injunctive relief).

89 RIN 2137-AF60; Parts 190 to 199, inclusive, of Title 49 of the Code of Federal Regulations.

90 Cal. Pub. Res. Code § 71465.

Post-closure liabilities

SNAPSHOT

SB 905 will include a regime surrounding post-closure liabilities, however until its implementation, post-closure liability will be equivalent to the federal regime.

229. SB 905 also imposes financial responsibility requirements on project operators, including, but not limited to, the short-term costs of corrective actions, the cost of any liability associated with damage to drinking water supplies or seismic activity triggered by the geologic storage reservoir or damage to public and environmental health and safety, and long-term costs associated with well plugging and abandonment, ongoing site care and monitoring, and site closure of the geologic storage reservoir.

Barriers to transfer

SNAPSHOT

SB 905 will impose more onerous obligations on operators applying for a permit compared to the federal approach. Further detail will be known once CARB set out further detail and establish the program.

230. Although California's CCS program is not yet implemented, SB 905 appears in places to be more onerous on operators than the federal Class VI Rule.

231. In addition to monitoring well data, SB 905 requires CCS operators to include the location and volume of stored CO_2 on any subsequent conveyances of property used for CCS.[91]

232. CalGEM's UIC Class II program, currently administers state regulation for the permitting, drilling, inspecting, testing, and sealing of Class II injection wells. In an effort to deter efforts to use CCS as a means to extract more oil and gas, SB 905 would prohibit the injection of concentrated CO_2 produced by any carbon capture, removal or sequestration project into a Class II well for purposes of enhance oil recovery.[92] This would prohibit enhanced oil recovery using CO_2 that is sourced from both: (i) a project that uses a process to separate CO_2 from industrial, commercial, or energy-related sources and produces a concentrated fluid of CO_2 with the intent of preventing emission of the CO_2 into the atmosphere; or (ii) a project that uses a process to remove CO_2 directly from the atmosphere.

233. California is also significantly behind its January 2025 deadline to implement the SB 905 program due to insufficient human resource and budget constraints since the bill was enacted. We expect further detail on California's CCS program to be set out in the regulations to be prepared by CARB.

91 Cal.Pub.Res.Code § 71462 (e).
92 Cal. Pub. Res. Code § 3132(b).

United States of America – Illinois

Issue	Comment	Risk
Existence and robustness of CCS regime	Illinois has not been granted primacy, and as such, the federal liability regime will apply	
Liability split between stakeholders	Equivalent to federal regime. Liability regime focuses solely on existing license holder. Liability of former license holders will be pursuant to commercially agreed transfer agreements	
Post-closure liability	50 year post injection site care period	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

234. Similar to California, Illinois has not been granted and is not seeking Class VI primacy, and therefore the federal Class VI Rule applies under the authority of the EPA (see paragraphs 169 to 182).

235. Set out below is a list of the main CCS related framework(s) in Illinois and the current status of legislation (where applicable) in connection with each:

    a. CCS Framework(s): the Safety and Aid for the Environment in Carbon Capture and Sequestration Act (SAFE CCS Act)[93] lays out a regulatory framework for CO_2 transportation and storage related activities, with a particular focus on pore space and landowner rights. The SAFE CCS Act requires an operator to obtain a carbon sequestration permit, in addition to the Class VI permit under the UIC Program.

    b. Ownership of Injected CO_2: title to CO_2 sequestered in Illinois is vested in the operator of the sequestration facility. The CO_2 is a separate property independent of the pore space.

    c. Monitoring and Reporting: prior to be issued with a permit, the operator must submit baseline reports of air and soil quality so that any damage during and following CO_2 injection can be tracked.

    d. Pore Space Ownership: pursuant to the SAFE CCS Act, Illinois has aligned with the American Rule, with title to pore space belonging to and vesting in the surface owner of the surface estate.

    e. Pore Space Unitization: if at least two pore space owners own pore space located within a proposed sequestration facility, the owners may agree to integrate the owners' interests to develop the pore space as a proposed sequestration facility for the underground sequestration of CO_2. If all of the pore space owners within a sequestration facility do not agree to integrate the pore space owners' interests, an operator may petition the Department of Natural Resources to issue an order requiring the pore space owners to integrate their interests. A minimum consent from pore space owners underlying at least 75% of the surface area above the proposed sequestration facility is required.

93 (SB 1289).

f. Subsurface Trespass: a claim of subsurface trespass shall not be actionable against an owner or operator conducting carbon sequestration activity in accordance with a valid Class VI permit and a permit issued by the Agency for a sequestration facility, unless the claimant proves that injection or migration of CO_2 substantially interferes with the claimant's reasonable use and enjoyment of their real property or has caused wrongful death or direct physical injury to a person, an animal, or tangible property.

g. Eminent Domain: A pipeline company may apply to the Illinois Commerce Commission for authorization of eminent domain under the Public Utilities Act.[94]

h. Administrative Agency: the Illinois Commerce Commission oversees the siting, construction, and operation of CO_2 pipelines.[95] The Illinois Department of Natural Resources reviews unitization applications over pore space rights. The Emergency Management Agency (Agency) as established by the SAFE CCS Act to ensure the safe operation of CCS sites.

Transfer liabilities

SNAPSHOT

The existing owner or operator is subject to the day-to-day liability incurred as a result of CCS activities. Given Illinois has not applied for primacy, a former license holder will be relieved of its liability once they have transferred their license.

236. The owner or operator may be subject to liability for any and all damage, including, but not limited to, wrongful death, bodily injuries, or tangible property damages, caused by a release attributable to the sequestration activity, including, but not limited to, damage caused by CO_2 or other fluids released from the sequestration facility, regardless of who holds title to the CO_2, the pore space, or the surface estate. The State is not liable for any damage caused by or attributable to CCS activity.

237. Liability for damage caused by a release attributable to the sequestration activity that is within a sequestration facility or otherwise within an operator's control, including CO_2 being transferred from a pipeline to the injection well, may be joint and several with a third party that caused or contributed to such damage. The operator is also responsible for all damage caused by CCS equipment, including pipelines.

238. The owner or operator shall maintain financial assurance in an amount equal to or greater than the cost estimated for all air monitoring, soil gas monitoring, emergency response, remedial action, and closure activities required. The owner or operator of the sequestration activity must use one or a combination of the following mechanisms as financial assurance: a fully funded trust fund, a surety bond guaranteeing payment, a surety bond guaranteeing performance or an irrevocable letter of credit.

239. CCS projects must demonstrate that they will not result in a net increase in potential emissions of the six pollutants regulated under the Clean Air Act's National Ambient Air Quality Standards.

240. Title to pore space may not be severed from title to the surface estate or transferred, but a grant of an easement or lease for use of pore space is permitted.

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94 735 Ill. Comp. Stat. Ann. 30/5-5-5; 220 Ill. Comp. Stat. Ann. 30/13.5.
95 220 Ill. Comp. Stat. Ann. 75/10.

241. An affected pore space owner is entitled to reasonable compensation from an operator for damages resulting from surface access to the affected pore space owner's property for required activities taken under a Class VI well permit, including compensation for damage to growing crops, trees, shrubs, fences, roads, structures, improvements, personal property, and livestock.

242. If there is a significant leak of CO_2 from a well all landowners shall be entitled to medical monitoring of a scope and duration to be determined by the Department of Public Health at the expense of the operator.

Post-closure liabilities

SNAPSHOT

Existing license holders are required to undertake remedial and monitoring obligations for a minimum of 30 years from the last day of injection. There is no express mechanism to allow liability to be transferred to the state post 30 years.

243. The SAFE CCS Act establishes a Trust Fund to cover costs related to remediation, monitoring, and compensation, funded by annual per-ton fees levied on CCS operators. Additionally, a separate Administrative Fund will be created to support the regulatory activities associated with overseeing CCS projects and will be funded from fees, fines, and penalties.

244. Developers of carbon capture projects are required to obtain state permits that require ongoing safety monitoring and post-injection site care for a minimum of 30 years from the last date of injection.

Barriers to transfer

245. The SAFE CCS Act halts approvals of new CO_2 pipelines until July 2026 or until new safety rules are established, which could limit the types and locations of carbon capture facilities being built.

246. Operators are required to have emergency response plans and provide training to ensure preparedness for incidents such as CO_2 release.

247. Following certification of closure by the EPA, the operator must show the position of the CO_2 and pressure front to ensure it does not pose an endangerment to groundwater or to human health or the environment, unless and until the Emergency Management Agency certifies that a carbon sequestration facility is closed. Air and soil gas monitoring required by a carbon sequestration activity permit issued by the Agency must continue until the Agency certifies the carbon sequestration facility as closed.

United States of America – New Mexico

Issue	Comment	Risk
Existence and robustness of CCS regime	HB 458 has been passed, which includes a dedicated, but untested CCS regime	
Liability split between stakeholders	Equivalent to federal regime. Liability regime focuses solely on existing license holder. Liability of former license holders will be pursuant to commercially agreed transfer agreements	
Post-closure liability	transfer post-closure stewardship responsibilities to the state after 5 years	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

248. New Mexico has not been granted and has not yet formally applied for Class VI state primacy, with the federal requirements and the EPA having regulatory jurisdiction (see paragraphs 169 to 182 above).

249. Set out below is a list of some of the key CCS related frameworks and New Mexico's legislative status (where applicable) in connection with each:

    a. CCS Frameworks: in March 2025, the New Mexico House of Representatives sought to introduce two companion House Bills, HB 457 and HB 458.[96]

    HB 457 (Geologic Carbon Dioxide Sequestration Act) was not passed into law (as of March 11, 2025 its status is noted as postponed indefinitely, as it did not pass the Senate Conservation Committee). The intention of the bill was to create a comprehensive legal and regulatory structure for CCS in New Mexico, including addressing concepts such as land rights and unitization, technical standards, operational requirements, and procedures for monitoring, reporting, and enforcement. It was then intended that HB 458 (see below) build on this framework to address longer-term stewardship post-closure of a site.

    HB 458 (Carbon Dioxide Storage Stewardship Act) (**CDSSA**) was passed into law (effective June 20, 2025) and some of the originally proposed elements of HB 457 did not die with that bill and were amended into HB 458. The new law includes relevant topics as discussed in further detail below, including the State's assumption of long-term liability, financial assurances and a dedicated fund, as well as some clarification of pore space ownership rights.

    HB 458 does not include sufficient detail regarding the process to apply for a permit or operate a well or other topics required for the state to apply for its own class VI primacy and therefore the federal requirements shall continue to apply. Both bills were also listed as companions to each other

96 Proposed HB 457, Geologic Carbon Dioxide Sequestration Act and Geologic Carbon Dioxide Storage Stewardship Act, 2025 N.M. HB 458.

and without the passing of HB 458 commentary suggests there is a question about how effective HB 457 is as a standalone act. As only HB 458 has been enacted into law and not HB 457, only the content of HB 458 (referred to as the CDSSA below) has been considered for this version of the report.

b. Monitoring and Reporting: the process and requirements for monitoring and reporting are not set out in the CDSSA. The act does reference that an operator must monitor of the site for the risk of future leakage as being one of the conditions to site closure before a certificate will be issued.

c. Pore Space Ownership: pore space is owned by the surface estate owner. Pore space may be separately conveyed in the manner provided by law for the transfer of interests in real property. The sale of minerals or other interests underlying the surface shall not convey ownership of any pore space unless the agreement explicitly conveys that ownership interest.[97]

d. Administrative Agency: The Oil Conservation Division of the Energy, Minerals and Natural Resources Department (referred to in the CDDSA as, the **division**) has been designated the primary regulator responsible for the implementation of the CDSSA. The division's powers include adopting and promulgating rules and issuing orders for the implementation of the provisions of the CDSSA.

Transfer liabilities

SNAPSHOT

The CDSSA does not address key concepts equivalent to those set in the federal requirements for Class VI wells or a regime for transferring liabilities between operators. New Mexico doesn't currently have the powers to pursue its own class VI primacy without further rule making needed.

250. The CDSSA is silent regarding transferring a permit between an existing and new well site owner, other than in connection with transferring to state ownership post-closure (see below).

251. New Mexico has not enacted any other state law addressing the transfer of liabilities in connection with Class VI wells. See the United States federal section of this report for the applicable Class VI Rule.

Post-closure liabilities

SNAPSHOT

The CDSSA establishes a stewardship fund, sets out a process for site closure and framework to transfer post-closure stewardship responsibilities to the state after 5 years. There are important limitations to that transfer, including if there are insufficient monies in the state's fund and an argument that some unknown liabilities may remain with the operator.

252. See the United States federal section of this report for the applicable Class VI Rule which still apply in addition to the CDSSA.

97 CDSSA, § 7.

253. The CDSSA provides that the division may grant an operator a certificate of closure (see below) not less than five years after the completion of injection activities and satisfaction of the requirements of the Geologic Carbon Dioxide Storage Stewardship Act, allowing for the transfer of stewardship to the state.[98]

254. The CDSSA also creates the "geologic carbon dioxide long-term storage stewardship fund" in the state treasury consisting of fees collected from operators based on the volume of tons injected. The fund shall be administered by the division for the following activities relating to class VI wells:

a. long-term monitoring;

b. remediation of mechanical problems;

c. repairing mechanical leaks;

d. plugging abandoned wells;

e. remediation of surface facilities, access, and rights of way related to a geologic sequestration site;

f. training and technology transfer related to CO_2 injection and geologic sequestration;

g. compliance and enforcement activities;

h. oversight and management after site closure; and

i. emergency response as deemed necessary by the director of the division.

255. The division will issue a certificate of completion to an operator only after it has complied with all of the following:

a. the operator is in full compliance with all laws governing the sequestration unit and sequestration facility;

b. the operator has resolved all claims, pending or perfected, regarding the sequestration unit and sequestration facility;

c. the sequestration unit is reasonably expected to retain the CO_2 stored in it;

d. the CO_2 is stable and does not show a significant risk of future movement and leakage;

e. all wells, monitoring devices, equipment and facilities to be used following the cessation of injection are in good condition and retain mechanical integrity; and

f. the operator has plugged all wells and removed all equipment and facilities, unless the equipment and facilities are needed for use following the cessation of injection, and has completed all reclamation work required by law.

256. Once a certificate issued, all stewardship responsibilities for which the fund has been set up (see above at 254) transfer to the state and the operator, owner and all persons who generated, transported or injected CO_2 and all owners otherwise having an interest in the CO_2 shall be released from all stewardship responsibilities. The state shall succeed and be subject to the terms of all agreements, permits, rules,

98 § 4(D).

regulations and orders applicable to the owner or operator and its successors, and the sequestration facility and all monitoring, repair and remediation required by law shall become the state's responsibility to be overseen by the division, unless and until the federal government assumes responsibility for the long-term monitoring and management of the sequestration unit and sequestration facility.

257. Although there is a broad release of stewardship obligations and an assumption by the state of a broad list of responsibilities, the CDSSA does not explicitly state that the owner or operators are fully released from all liability. There are also limitations on the release of these stewardship obligations, and such release shall not apply if the division determines any of the following list of six scenarios applies;

a. the person provided deficient or erroneous information that was material and relied upon by the division to support approval of the sequestration facility's certification of completion;

b. the person concealed or misrepresented facts relating to the mechanical integrity of the sequestration facility or sequestration unit or the chemical composition of the injected CO_2;

c. the operator violated a state statute or rule related to the sequestration facility that was not remedied prior to approval of site closure and any applicable statutes of limitation have not run;

d. liability arises from the operator's conduct associated with the sequestration facility or sequestration unit that, if known, would have materially affected the division's decision in issuing the certification of completion;

e. the division determines that there is fluid migration for which the owner or operator is responsible that causes or threatens imminent and substantial endangerment to an underground source of drinking water; or

f. the division determines that the geologic carbon dioxide long-term storage stewardship fund is insufficient to cover costs arising from the sequestration unit or sequestration facility.

258. Two of the above scenarios are particularly notable. Firstly, regarding paragraph f above, the state's liability is effectively capped at the balance in the stewardship fund. If there are insufficient funds then any of those who generated, transported or injected CO_2 or otherwise had an ownership interest in the CO_2 may be liable.

259. Secondly, regarding paragraph d above, if any unknown liability arises during the state's ownership, the state may argue that such liability arose because of the operators conduct simply because the operator operated the site and therefore all acts or omissions are attributable to the operator's conduct. This may put the risk of the unknown back on to the operator.

Barriers to transfer

SNAPSHOT

New Mexico has had several attempts to pursue Class VI primacy by introducing legislation to its House of Representatives. The more detailed proposed legislation was postponed indefinitely during the 2025 legislative session. Until further legislation is enacted and primacy granted, CCS in New Mexico remains predominantly governed by the federal regime.

260. HB 457 has been postponed indefinitely by the New Mexico legislature and there does not appear to be any immediate course of action for New Mexico to obtain its own Class VI primacy. Any New Mexico Class VI well permit applications or transfers will be subject to the same barriers to transfer as under the federal requirements, however unlike under the federal requirements, New Mexico does have a regime for transferring ownership to the state post-closure.

Brazil

Issue	Comment	Risk
Existence and robustness of CCS regime	Nascent CCS regime in the process of developing regulations for CCS projects relating to transfer liabilities	
Liability split between stakeholders	While the CCS regime is still in development, existing environmental laws allow for liability for past actions to persist, requiring a party to prove the source of the damages	
Post-closure liability	Operator remains liable for any damages that might occur post contract	
Security requirements	There are no security requirements	
Overall legislative and regulatory risk		

Summary

261. In 2024, the Brazilian Congress approved Law No. 14,993 (**Law No. 14,993/2024**), which, among other provisions regarding decarbonization, established the regulation and inspection of Carbon Capture and Storage (**CCS**) activities. This law represents the first regulatory framework to specifically address the subject in the country.

262. Law No. 14,993/2024 assigned the responsibility of regulating CCS activities to the Brazilian National Agency for Petroleum, Natural Gas, and Biofuels (**ANP**). Law No. 14,993/2024 prescribes general rules for CCS activities, such as a term of thirty (30) years for CCS project authorizations, which may be extended for an equal period or modified in cases of significant public interest.[99]

263. Further, Law No. 14,993/2024 provides that, in the case of areas under a contract granting exploration and production (**E&P**) rights, the ANP will only issue the CCS authorization after hearing the holder of such rights, i.e. a concessionaire.[100]

264. However, Law No. 14,993/2024 only addressed the transfer of authorisation and does not regulate the transfer of liability to the State after the authorization period ends, explicitly assigning to ANP the authority to define the criteria for authorization transfer. Consequently, there is currently no established framework regarding the transfer of liabilities for CCS licenses.

265. Despite the lack of specific regulations for CCS projects, current initiatives have been authorized as Enhanced Oil Recovery (**EOR**), based on ANP Resolution No. 17/2015 (**RANP 17**), which provides technical guidelines for hydrocarbon E&P field development plans.

266. Petrobras, a privately held company controlled by the Brazilian federal government, leads Brazil's first and longest-running CO_2 utilization and storage initiative—widely recognized as one of the world's largest CCUS-EOR programs. In 2025 alone, Petrobras re-injected 19.6 million tonnes of CO_2, exceeding its sustainability commitment to re-inject a cumulative 80 $MtCO_2$ by 2025 since the start of operations.

99 Article 26, §3 of Law No. 14,993/2024.
100 Article 28, §1 of Law No. 14,993/2024.

267. Thus, the current legislation regarding E&P rights can be referenced for future ANP regulations and can guide ANP's decisions concerning CCS transfer liabilities, post-closure liabilities, and barriers to transfer.

Transfer liabilities

SNAPSHOT

Transfer liabilities under the Brazilian Law No. 14,993/2024 are still in development, however are likely to be guided by existing petroleum laws.

268. According to Law No. 14,993/2024, the conditions for transferring CCS licenses are to be defined by ANP,[101] but these conditions are not yet developed.

269. In December 2024, the ANP issued Board Resolution No. 859/2024, establishing guidelines to make CCS projects viable while the specific regulatory framework is being developed. This resolution authorized the assessment of CCS projects, whether ongoing or in the implementation process, through experimental regulation via pilot projects, ensuring legal certainty for entrepreneurs until definitive rules are established.[102]

270. Therefore, if an entity obtains experimental authorization to develop CCS activities and wishes to transfer the license, it will be necessary to discuss the transfer rules with the ANP.

271. Petrobras already develops CCS-EOR activities under RANP 17 and other E&P guidelines, subjecting CCS to E&P legislation. Therefore, it is possible to assume that ANP can use E&P liability assignment rules to support CCS activities.

272. In Brazil, the assignment of liability in E&P is primarily guided by ANP Resolution No. 785/2019 (**RANP 785**), which regulates the assignment of E&P rights, and ANP Resolution No. 817/2020 (**RANP 817**), which addresses decommissioning obligations in E&P activities.

273. While there is no specific regulation for CO_2 storage, the ANP may consider these frameworks as guidance for structuring liability. Below is a possible structure for transferring liabilities based on the aforementioned regulatory framework of E&P contracts.

274. It is important to note that E&P activities are granted under a concession or participation regime, which is more robust compared to the authorization regime under which CCS project licenses will be issued. Therefore, it can be anticipated that there will be fewer barriers to the transfer of authorizations for CCS projects. It is emphasised that the description of current, former and incoming/future operator liability that is set out below provides guidance, informed by existing E&P resolutions RANP 785 and RANP 817 for how transfer of liabilities may work in the context of CCS projects, noting that, at present, there is no specific regulation on this subject as ANP works to define the conditions for transferring CCS licenses.

101 Article 26, §2 of Law No. 14,993/2024.
102 Item I of ANP Board Resolution No. 859/2024.

Current Operator Liability

SNAPSHOT

The current operator is liable for the day-to-day activities under the relevant license and subsequent decommissioning obligations. Further, Brazilian environmental law imposes strict, joint and unlimited liability in relation to environmental damage.

275. The current license holder or operator bears primary responsibility for all operational and environmental risks associated with the field or site. This includes:

    a. safe operation and maintenance of wells, infrastructure, and installations;

    b. compliance with technical standards, environmental legislation, and contractual obligations;

    c. decommissioning obligations, including well plugging and abandonment (P&A), and proper removal or reuse of infrastructure (as outlined in RANP 817); and

    d. environmental liability, which under Brazilian law is strict, joint, and unlimited in certain cases (especially regarding environmental damage), meaning the operator may be held liable regardless of fault.

Former Operator Liability

SNAPSHOT

Post-transfer, a former operator is released from all future operational responsibilities. However, liability may persist for former operators under environmental laws.

276. In general, once a contractual assignment is approved by the ANP, the former operator is released from future operational responsibilities.

277. However, Brazilian law—particularly environmental law—allows for liability for past actions to persist, especially in cases of environmental damage.

278. This means that a former operator may still be held accountable for remediation or damages if it is proven that such issues originated during their period of activity, even after the asset or license has been transferred.

Incoming/Future Operator Liability

SNAPSHOT

Incoming operators inherit liability for ongoing operations, and any unresolved liabilities not directly linked to the actions of the previous operator.

279. The incoming operator becomes fully liable from the date the assignment is formally approved by the ANP.[103] The agency evaluates the technical, legal, and financial capacity of the new operator before approving the transfer, ensuring that it can fulfill all existing and future obligations associated with the asset.[104]

280. This operator inherits responsibility for ongoing operations, compliance, and any unresolved liabilities not directly linked to the actions of a previous operator.

281. Currently, there is no legal provision for the transfer of long-term liability to the State (as would be required in a post-closure CCS framework).

282. For future CCS regulation, the legal framework would need to establish clear rules for post-closure monitoring, financial guarantees, and potential government takeover after a defined period of closure and monitoring.

Post-closure liabilities

SNAPSHOT

There is currently no regulatory framework for post-closure liabilities in CCS projects.

283. RANP 817 establishes guidelines for the decommissioning of E&P facilities. Although designed for E&P contracts, this rule can serve as a reference for future regulation of CCS, since there is no specific regulatory framework for post-closure liabilities in CCS projects yet, and current CCS activities are regulated under RANP 817.

284. According to RANP 817, the operator is responsible for the decommissioning of oil and gas fields, including wells related to EOR activities. The termination of the contract does not absolve the operator from its legal obligations toward landowners and other municipal, state, or federal entities.[105]

285. Therefore, even when the contract is terminated following the legal procedure, the operator remains liable for any damages that might occur.

286. Additionally, as previously mentioned, in the context of CCS, after the thirty (30) years authorization period or its extensions, it is still unclear who will be liable for monitoring the site after the injection operations of greenhouse gases have ceased, providing the guarantees, and indemnifying in case of damages.

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103 Article 8th of ANP Resolution 785/2019.
104 Article 44 of ANP Resolution 785/2019.
105 Article 62, of ANP Resolution no. 817/2020.

Barriers to transfer

SNAPSHOT

Currently, the only barrier to transfer is the requirement that the transferee is a company, or a consortium, established under Brazilian law, with headquarters and administration in the country.

287. The only legal barrier for transfer imposed by Law No. 14,993/2024 is that the transferee must be a company, or a consortium of companies established under Brazilian law, with headquarters and administration in the country.

288. Aside from that, there are no other legislative or non-legislative barriers to the transfer of a CCS project authorization under Brazilian jurisdiction.

289. Considering that the ANP, the authority responsible for regulating and inspecting oil and gas activities in Brazil, is also in charge of regulating and inspecting CCS activities, we can draw a parallel regarding barriers to the transfer of licenses for CCS projects.

290. RANP 785/2019 establishes guidelines for the assignment of E&P contracts, providing that petroleum operators must obtain prior approval from the ANP before transferring rights and obligations under an E&P contract.

291. This transfer authorisation process involves the assessment of technical, economic, and legal aspects of the new operator to ensure that it can fulfill contractual commitments.

292. However, as previously mentioned, E&P activities are granted under a concession or participation regime, which is more robust than the authorisation regime under which licenses for CCS projects will be issued. Therefore, it can be expected that there will be fewer barriers to the transfer of authorizations concerning CCS projects.

United Kingdom

Issue	Comment	Risk
Existence and robustness of CCS regime	Comprehensive and relatively tested CCS framework	
Liability split between stakeholders	Regime clearly delineates liability between various proponents however does not expressly indicate priority where two proponents are liable to undertake the same activity	
Post-closure liability	20 year minimum period after the end of CO_2 injection	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

293. In the UK, the Energy Act 2008 creates a licensing regime for the storage of carbon dioxide, which makes it an offence to carry on the activity of carbon dioxide storage without a carbon dioxide appraisal and storage license (**Storage License**) issued by the North Sea Transition Authority (**NSTA**), the regulator responsible for administering and enforcing the regulatory regime for carbon dioxide storage.

294. Monitoring obligations, as well as liabilities, arise pursuant to the Storage of Carbon Dioxide (Licensing etc.) Regulations 2010 (**Licensing Regulations**), the Storage of Carbon Dioxide (Termination of Licenses) Regulations 2011 (T**ermination Regulations**) and the Storage Permit issued to the holder of a Storage License (**Licensee**). The UK licensing regime for carbon dioxide storage was established to implement the requirements of the EU CCS Directive,[106] at a time when the UK was part of the EU, and therefore some of the elements of the regime (in particular, provisions of the Licensing Regulations and the Termination Regulations) refer to specific requirements set out in the CCS Directive.

295. During the operations phase of a storage site (that is, while carbon dioxide is being injected into the storage site), the Licensee is responsible for monitoring the storage site and taking any remedial action, and will also bear any associated liabilities. These liabilities remain with the Licensee for a period of at least 20 years following closure of the storage site, at which time, provided certain conditions are satisfied, certain obligations and liabilities will be transferred to the UK Government and the Storage License will be terminated. This transfer of obligations and liabilities to the Government is subject to a “clawback” power, which allows the Government, following the transfer, to recover any costs incurred by the Government as a result of “a fault” on the part of the Licensee.

296. Decommissioning obligations are addressed separately, pursuant to an offshore decommissioning regime under the Petroleum Act 1998 (that also applies to offshore oil and gas installations), as amended by the Energy Act 2008 to apply to offshore carbon dioxide storage installations (including pipelines). Because the UK Government has obligations under international law to ensure that offshore decommissioning is implemented (and is therefore, in effect, “the decommissioner of last resort”), the offshore decommissioning regime is designed to ensure that UK taxpayers are protected from offshore decommissioning costs.

106 Directive 2009/31/EC of the European Parliament and of the Council on the geological storage of carbon dioxide.

Therefore, under the Petroleum Act 1998, parties that were previously Licensees in relation to a storage site, as well as current Licensees, and associated bodies corporate of those parties, may be liable for decommissioning costs.

297. It is relevant to note in this context that the UK recently implemented an economic regulatory regime for carbon dioxide transport and storage networks, under the Energy Act 2023. Under the economic regulatory regime, which is modelled on the regulatory regime that applies to gas and electricity networks, operators of carbon dioxide transport and storage networks also need an economic license from the economic regulator, Ofgem, and are subject to various conditions under that economic license. The economic license conditions address matters such as the allowed revenue that the carbon dioxide transport and storage company (the **T&S licensee**) is able to recover from users of the carbon dioxide transport and storage network, and in doing so, recognise the T&S licensee's post-closure and decommissioning obligations, by providing for the accumulation of a decommissioning fund during the operations phase. Also, the two T&S licensees that reached financial close in 2024 and 2025 were offered a "Government Support Package" designed to provide support in relation to certain risks under the current regime, including the provision of an insurance-like product to support the T&S licensees where there is limited or unavailable commercial insurance to cover the risk of carbon dioxide leakage during operations as well as during the post-closure period. A detailed analysis of the economic regulation of carbon dioxide transport and storage networks is outside the scope of this report.

Transfer liabilities

298. Transfer of liabilities and obligations relating to a storage site are primarily set out in the Licensing Regulations, the Termination Regulations, the Storage License and the Storage Permit.

Current Licensees

SNAPSHOT

A current Licensee (including where that Licensee has acquired the asset from another party) will be liable for the day-to-day activities under the relevant Storage License. They will further be liable for any "serious situations" and eventual post closure liabilities, as well as remedial measures.

299. A Licensee is not able to commence injection of carbon dioxide into a storage complex until it has been granted a Storage Permit by the NSTA. The NSTA will only issue a Storage Permit if it is satisfied that the storage complex has been sufficiently characterised and assessed, there is no significant risk of leakage and the proposed operator is technically competent (amongst other things).[107] The Licensee, as holder of the Storage Permit, bears all liability for the storage site until the Storage License is terminated and liability is transferred to the Government in accordance with the Termination Regulations. Licensees are expected to manage the risks associated with that liability through commercially available insurance. However, the Government has acknowledged that where certain risks cannot be covered by commercial insurance, at least while CCS is still a nascent industry, the Government will provide some additional support to Licensees (as part of a Government Support Package) where those Licensees have been selected to operate carbon dioxide transport and storage networks through the Government's "CCUS cluster sequencing programme".

107 Licensing Regulations Reg. 7.

300. The Storage Permit is one of the key instruments that imposes various obligations on the Licensee to manage the risks associated with carbon dioxide storage, including the following:[108]

a. operational requirements, including the total quantity of carbon dioxide that may be stored and the maximum injection rates and pressures;

b. provisions relating to monitoring, including a monitoring plan;

c. provisions relating to reporting and notification of leakages and significant irregularities;

d. a corrective measures plan and provisions relating to corrective measures;

e. conditions for closure of the storage site;

f. a provisional post-closure plan; and

g. provisions relating to financial security.

301. During the operational phase of the life of a storage site, the Licensee's monitoring plan plays a key role. The plan must detail the monitoring that will be carried out by the Licensee to allow demonstration of conformance and containment, detection, and measurement of a significant irregularity or leakage event. Additionally, it needs to detail any enhanced or specific monitoring that will be required if a significant irregularity or leakage event is detected. The plan should be designed to inform the appropriate corrective measures to be deployed and measure the effectiveness of those measures deployed and therefore assess the integrity of the storage complex over both the short and long term.

302. If the Licensee becomes aware of any leakage or significant irregularities as part of its monitoring activities, the Licensee must carry out corrective measures to address this, as set out in the Licensee's corrective measures plan or other necessary measures.[109] If the NSTA directs the Licensee to carry out any corrective measures and the Licensee fails to carry out such measures, then the NSTA may arrange for such corrective measures to be undertaken at the Licensee's cost.

303. Approval of a provisional post-closure plan by the NSTA is a prerequisite to the Licensee being granted a Storage Permit. The provisional plan is subject to revision following the grant of a Storage Permit, in agreement with the NSTA and other regulatory bodies, dependent on the outcome and performance of carbon dioxide injection, monitoring data, analysis of relevant risks, best practice at the time, and improvements in technology. The provisional post-closure plan is required to set out how a site will be sealed and how injection facilities at the site will be removed. It should also include the monitoring required to demonstrate the absence of any detectable leakage and the conformance of the carbon dioxide to that forecast in the dynamic modelling. The provisional plan should also describe the monitoring required to demonstrate the long-term stability of the carbon dioxide in the store, indicating that it can and will be completely and permanently contained in the storage site and storage complex, to enable the termination of the License and the transfer of responsibility under the Termination Regulations.[110]

304. Ultimately, the liability and obligations regime under the Licensing Regulations and the Storage Permit places all responsibility on the current Licensee, who is the holder of the Storage License and Storage

108 Licensing Regulations Reg. 8 and Schedule 2
109 Licensing Regulations Reg. 10 and Schedule 2.
110 Licensing Regulations Reg. 13 and the NSTA's "Guidance on the content of an offshore carbon storage permit application".

Permit, and those statutory obligations and liabilities are not impacted by the fact that other parties (including previous Licensees and carbon dioxide emitters whose carbon dioxide is being injected into the storage) may have been in some way responsible. As such, the Licensee must implement measures to manage that risk – for example, through contractual arrangements with third party emitters. Contractual provisions (which, in the UK, are currently likely to be pursuant to a multi-party CCS Network Code) will include provisions which, among other things, will require emitters to ensure that the carbon dioxide stream complies with a certain specification. If a Licensee was disposing of its interest under a Storage License, the purchaser (as the new Licensee) would be likely to seek an indemnity from the former Licensee in relation to any liabilities relating to events occurring before the transfer.

305. As mentioned in the Summary, the decommissioning regime for offshore carbon dioxide installations is established under the Petroleum Act 1998. In particular, a so-called "section 29 notice"[111], issued by the Secretary of State under the Petroleum Act 1998, requires a person to submit a decommissioning programme for approval by the Secretary of State, making all those served with the notice jointly and severally liable for decommissioning costs. While the section 29 notice will be served on the current Licensee, it will typically not be withdrawn merely because the Licensee disposes of its interest under the Storage License. Moreover, if the Secretary of State (acting through the Offshore Petroleum Regulator for Environment and Decommissioning (**OPRED**)) considers that current or former Licensees have not made appropriate arrangements for decommissioning, it can also serve a section 29 notice on connected parties (such as associated bodies corporate). This potential liability is usually addressed through financial security arrangements. Significantly, the UK Government is planning to introduce a statutory requirement for Licensees to establish a ring-fenced decommissioning costs fund, to be built up over the operational phase of a storage site.

Former Licensees

SNAPSHOT

Upon transfer of a Storage License, the former Licensee will not have liability to undertake monitoring or corrective measures, but it will have potential decommissioning liability.

306. Once a Licensee has transferred its interest under the Storage License, it will not have ongoing liabilities, except for decommissioning liabilities, as described in paragraph 304. There may be some exceptions in relation to liabilities that have already crystallised at the time the Licensee held the Storage License.

Former Petroleum Licensees

SNAPSHOT

Former petroleum production licensees may have decommissioning liability in relation to assets that are re-purposed for CCS, but may be able to apply for relief from that liability.

307. In the UK, even though depleted gas fields may be used for carbon dioxide storage, there is no process for a petroleum production license (issued by the NSTA pursuant to the Petroleum Act 1998) to be directly

111 Petroleum Act 1998 s 29.

converted into a Storage License. However, issues relating to liability as between petroleum productions licensees and carbon dioxide storage site Licensees can arise where former oil and gas production assets are being re-purposed for use at carbon dioxide storage sites – so-called "re-use assets". Specifically, the former owners of the repurposed re-use assets could be liable to be served with another section 29 notice when the re-use assets are used for carbon dioxide storage related activities.

308. Provided certain conditions are satisfied, it is possible for the former owners of re-use assets to apply to OPRED for "change in use relief" (**CoUR**), to relieve them of potential future decommissioning liability.[112] The availability of CoUR was introduced to address instances where existing owners of an asset with re-purposing potential would be reluctant to sell the asset for use in a carbon dioxide storage and transport network given the risk of being called upon to contribute to future decommissioning liabilities and the uncertainty around these costs.

Post-closure liabilities

SNAPSHOT

Following the closure of a storage site, provided certain conditions have been satisfied and a period of 20 years had elapsed, the Licensee is eligible to apply for the Storage License to be terminated and various obligations and liabilities to be transferred to the Government.

309. The closure of a storage site does not absolve the Licensee of responsibility for the storage site,[113] at least not until the Storage License has been terminated and obligations and liabilities have been transferred to the Government under the Termination Regulations (see below). During the post-closure period, the Licensee will be responsible for activities such as ongoing monitoring, any corrective measures, the safe removal of injection facilities and decommissioning of any operational wells that will not be used for post-closure monitoring.

310. Where a storage site has been closed in accordance with the terms of the Storage License, the Licensee may apply to the NSTA for the Storage License to be terminated.[114] Such an application must be accompanied by a transfer report in respect of the storage site. The transfer report must demonstrate, at a minimum:

    a. that the injected carbon dioxide conforms with the modelled behaviour;

    b. the absence of any detectable leakage; and

    c. that the storage site is evolving towards a situation of long-term stability.[115]

311. However, a Licensee can only apply to have the Storage License terminated once a "minimum period" has elapsed since the storage site was closed, and this minimum period, which is determined by the NSTA when it approves a provisional post-closure plan, must be no less than 20 years.[116] There is scope for that minimum period to be reduced upon the satisfaction of the "transfer conditions" (that is, the conditions

112 Energy Act 2008 s 30A, as amended by the Energy Act 2023.
113 Licensing Regulations Reg. 14.
114 Termination Regulations Reg. 4.
115 CCS Directive Article 18(2).
116 Termination Regulations Reg. 7.

that need to be satisfied to transfer liabilities and obligations to the Government). The transfer conditions are that:

a. all available evidence indicates that the stored carbon dioxide will be completely and permanently contained;

b. the minimum period has elapsed;

c. the operator has provided the financial contribution notified it is required to provide to cover the expected post-transfer costs;

d. the storage site has been sealed and the injection facilities have been removed; and

e. the decommissioning programme has been carried out in accordance with Part 4 of the Petroleum Act 1998.[117]

312. Upon the relevant requirements being satisfied and the Storage License being terminated, the following obligations of the Licensee are transferred to the Government:

a. monitoring;

b. corrective measures;

c. the offset of emissions which are leakage under the relevant climate change legislation (in particular, the system of allowances for carbon dioxide emissions under the UK emissions trading scheme);[118] and

d. preventative and remedial action under the legal regime relating to the prevention and remedying of environmental damage.[119]

313. As well as the transfer of various obligations upon the termination of a Storage License, any leakage liabilities incurred by the Licensee prior to the termination of the license are also transferred to the Government, except for any leakage liabilities that, on termination of the Storage License, constitute a debt that is already payable by the Licensee.[120]

314. While, the obligations and liabilities are transferred to the Government, the Government may recover from the Licensee any costs incurred by the Government as a consequence of the transfer of the relevant obligations and liabilities to the extent that such costs arise "due to fault on the part of" the Licensee.[121] The provision makes it clear that "fault" can include negligence, deceit or failure to exercise due diligence.

117 Termination Regulations Reg. 8.
118 The UK ETS is established under the Greenhouse Gas Emissions Trading Scheme Order 2020.
119 Termination Regulations Reg. 14.
120 Termination Regulations Reg. 15.
121 Termination Regulations Reg. 16.

Barriers to transfer

SNAPSHOT

Any transfer of a Storage License will be subject to legislative and non-legislative barriers (e.g. financial and technical requirements of transferee).

315. Under the carbon dioxide licensing regime, a Licensee is able to transfer its interest (whether in whole or in part) under a Storage License only with the consent of the NSTA.[122] In assessing the transfer application, the NSTA will have regard to a number of different matters[123], including:

a. the financial and technical competence of the proposed transferee, as the transferee must be capable of discharging all the obligations under the Storage License;

b. the transferee's ability to demonstrate its independence in carrying out or controlling the activities under the Storage License, including acting promptly to meet the requirements of the Storage License and the overall regulatory regime, as well as cooperating with the NSTA on such regulatory matters in a timely fashion; and

c. the "fitness" of the transferee and other persons connected with the transferee. In particular, directors of the transferee and individuals involved in the management of the transferee must have knowledge of, and comply with, the NSTA's requirements as to "fitness", which includes a consideration of factors such as whether the transferee, its directors or relevant individuals have been subject to insolvency proceedings or criminal proceedings (among other things).

122 Restrictions on transfer are set out in the Storage License. There are also restrictions on a change in control of the Licensee.
123 NSTA's guidance: "Carbon Dioxide Appraisal and Storage License: License Transfer and Change in Control Approach".

Canada – Alberta

Issue	Comment	Risk
Existence and robustness of CCS regime	Comprehensive and tested CCS framework with clear transfer liabilities between proponents	
Liability split between stakeholders	Regime clearly delineates liability between various proponents however does not expressly indicate priority where two proponents are liable to undertake the same activity	
Post-closure liability	Alberta assumes significant long-term responsibilities and liabilities related to actions, claims or damages that occur after the Closure Certificate is issued, but not for pre-existing claims or incidents prior to the issuance of the Closure Certificate	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

316. All pore space below the surface of land in Alberta is the property of the Crown in right of Alberta.[124] As such, a pre-requisite to any CCS project in Alberta, including the right to drill wells for the purpose of geological evaluation and the lease of the pore space for permanent geological sequestration of CO_2, is entering an evaluation agreement and carbon sequestration agreement with the Minister of Energy and Minerals (the **Minister**).[125] A standard form Carbon Sequestration Agreement (**CSA**) has been developed in consultation with industry that is intended to serve as the starting point for the negotiation process, delineating the rights and responsibilities of a project proponent (the **Agreement Holder**) operating a CCS project in the province.

317. The Alberta Mines and Minerals Act (**MMA**) specifies that an Agreement Holder, as a person exercising a right to use a well or drill a well for injection into an underground formation, must indemnify Alberta for loss or damage suffered by Alberta in respect of any claims or demands made by reason of anything done in exercise of the right to use a well, or drill a well, for injection into an underground formation.[126] Upon the cessation of injection of CO_2 into a well or wells, an Agreement Holder can apply to the Minister for a Closure Certificate in accordance with the regulations.[127] If a Closure Certificate is issued, Alberta becomes the owner of the injected CO_2 pursuant to the CSA and assumes certain obligations of the Agreement Holder and, subject to the Act, Alberta owes an indemnity to the Agreement Holder for actions in tort.[128]

124 MMA, RSA 2000, c M-17, s 15.1(1)(b).
125 MMA, s 117.
126 MMA, s 56(2)(a).
127 MMA, s 120(1).
128 MMA, s 121(2).

Transfer liabilities

318. Under the Alberta legislative regime, transfer liabilities arise upon closure of the well. As stated above, once a Closure Certificate is issued for a well, certain liabilities associated with the CO_2 injected into such well are transferred from the Agreement Holder to the Province of Alberta. The Agreement Holder remains liable for injected CO_2 until the issuance of a Closure Certificate.[129]

Current Agreement Holders

SNAPSHOT

Current Agreement Holders are subject to a comprehensive set of liabilities throughout the entirety of the CCS project lifecycle, including contractual and tort liability, environmental liability, monitoring, restoration, remedial and decommissioning liability.

319. During the course of a CCS project's construction, its operational life and its closure period, Agreement Holders are responsible for and liable for any claims related to their contractual obligations with their customers and other third parties and for any claims in tort by their customers and other third parties during the operations period.

320. Under section 56(2)(a) of the MMA, the Agreement Holder is liable to indemnify the Crown in right of Alberta for loss or damage suffered by the Crown in respect of any claims or demands made by reason of anything done by that person or any other person on that person's behalf in the exercise or purported exercise of that right.[130]

321. Pursuant to the *Environmental Protection and Enhancement Act*[131] which prohibits the release, knowingly or not, of a substance that causes or may cause significant adverse effects, the "person responsible" for a released substance is liable for restoration and remediation related to the release, and for any measures under an Environmental Protection Order.[132] Violations may lead to fines up to $1,000,000 for corporations and $100,000 (plus up to 2 years in prison) for individuals if done knowingly, or lesser penalties otherwise.[133]

322. Under the *Oil and Gas Conservation Act* (**OGCA**), persons who commence to, or undertake to, drill a well for any producing or injecting operations require a license.[134] Well licensees are responsible for ensuring that CO_2 does not pose a safety hazard, cause a nuisance, or negatively impact the environment.[135]

323. A CO_2 leak from a CCS facility may lead to the cancellation of emission offsets, sequestration credits, or capture recognition tonnes that have been issued under Alberta's TIER regulation.[136] The Agreement Holder is also liable for any fines and offences respecting releases that contravene federal environmental legislation. Releasing harmful or deleterious substances that may affect protected wildlife species is

129 MMA, s 121.
130 MMA, s 56(2)(a).
131 *Environmental Protection and Enhancement Act*, RSA 2000, c E-12 (EPEA).
132 EPEA, s 107-122.
133 EPEA, s 228.
134 OGCA, RSA 2000, c O-6., s 11.
135 *Oil and Gas Conservation Rules*, Alta Reg 151/1971 (OGCR), s 8.150(4) and s 1.020(2)(12.1).
136 Alta Reg 133/2019 (TIER), ss 22(2) and 22(2.1).

prohibited under various federal statutes, including the *Fisheries Act, Migratory Birds Convention Act, and Species at Risk Act*.[137]

324. Under the *Carbon Sequestration Tenure Regulation* (**CSTR**),[138] in order to conduct any operations or activities under a CSA, an Agreement Holder must: (i) have an approved Monitoring, Measurement, and Verification plan (**MMV**) that is in effect for the term of the CSA; and (ii) comply with the approved MMV plan, which sets out the monitoring, measurement, verification, and risk management activities that a project proponent will undertake for the term of the CSA.[139] The injection of CO_2 contrary to an MMV Plan may constitute an offence punishable under the MMA by forfeiture of all installations and equipment used in connection with the said injection to Alberta free and clear of all interests, charges and liens and a monetary fine of up to $100,000 per offence.[140]

325. Under the CTSR, an Agreement Holder must pay into a Post-Closure Stewardship Fund a fee per tonne of captured CO_2 injected into the location of a CSA at a rate established by the Minister.[141] Once Alberta has assumed liability post-closure, this fund can be used by Alberta in conducting long-term monitoring and maintenance of completed projects for which it holds liability.[142]

326. The provisions under the CSA provide the following obligations for the Agreement Holder:[143]

    a. There is an indemnity obligation in favour of Alberta for actions, claims and demands brought against Alberta due to the exercise of the rights granted and duties imposed under the CSA. This indemnity obligation survives the termination of the Agreement, until the issuance of the Closure Certificate under the MMA.

    b. There is a release of liability in favour of Alberta for any loss or damage suffered by the Agreement Holder.

    c. Before starting any sequestration activities, an Agreement Holder must provide proof of insurance, including errors and omissions liability, general liability, and environmental liability insurance, in a form acceptable to the Minister.

Former Agreement Holders

SNAPSHOT

Former Agreement Holders of a CSA will remain liable for certain contractual obligations, tortious damages, debts and claims. These liabilities survive even after the termination of the CSA, with the liabilities persisting until all obligations of the Agreement Holder under the CSA have been met.

137 *Fisheries Act*, RSC 1985, c F-15, ss 34(1), 36(3); *Migratory Birds Convention Act*, SC 1994, c 22, s 5.1 (MBCA); *Species at Risk Act*, SC 2002, c 29, ss 32-33 (SARA).
138 CSTR.
139 CSTR, s 17.
140 MMA, ss 54(1)(b), 54(2.1) and 63(1)(a).
141 CSTR, s 20.
142 Government of Alberta, "Carbon Sequestration Agreement Guidelines" (26 September 2023), PDF 7 (CCS Agreement Guidelines).
143 CSA, Article 17.

327. While the Province assumes significant liabilities related to the injected CO_2 upon the closure of the well and the issuance of the Closure Certificate, the former Agreement Holder retains certain liabilities and obligations post-closure.

328. Under various legislative schemes, the former Agreement Holders will be liable for certain contractual obligations, tortious damages, debts and claims as described in paragraphs 337 to 341 below. Regarding the Agreement Holder's contractual liability under the CSA, the Agreement Holder's responsibilities under the CSA survive the termination of the CSA.[144] The terms under the CSA remain in effect until all obligations of the Agreement Holder under the CSA have been met, including completion of all closure activities.[145]

329. The Agreement Holder is responsible for all closure activities. Once the carbon sequestration injection phase has been completed for a given CCS hub, an Agreement Holder can inform the Crown of its intent to cease hub operations and apply to the Alberta Energy Regulator (**AER**) for approval to begin Closure Period activities as detailed in its MMV plan. The MMV plan, encompassing closure and post-closure activities, monitoring, and maintenance, will be tailored to each project based on its specific details and identified risks.[146] The closure plan must satisfy the Minister that the Agreement Holder will undertake to close sequestration operations and facilities.[147]

Producer / Former Owner of CO_2

SNAPSHOT

A former producer / owner of the CO_2 stored will continue to be liable for restoration and remedial activities under the relevant CSA regardless of who holds title.

330. A producer or former owner of the CO_2, an entity that generated the CO_2 prior to it being captured and stored as part of CCS, may continue to hold title to CO_2 and be liable for CO_2 following its delivery to the Agreement Holder for sequestration, depending on the terms of its contract for sequestration services with the Agreement Holder.

331. Regardless of who holds title to and liability for the CO_2, the producer and all former title holders of the CO_2 may remain liable in their capacity as a "person responsible" under the EPEA for restoration and remediation related to a release, and for any measures under an Environmental Protection Order. Under EPEA, a "person responsible" for a substance is broadly defined to include: (i) the owner and a previous owner of the substance or thing; and (ii) every person who has or has had charge, management, or control of the substance or thing. There is no legal framework setting out a priority system for the continued liability of former owners, therefore all former owners share the liability. Previous producers and owners of the CO_2 may be able to enter into agreements to allocate risks and responsibilities under the EPEA.

144 CSA, Article 18.
145 CSA, Article 18.
146 MMA, s 119; CSTR, s 19.
147 MMA, s 119; CSTR, s 19.

Former Petroleum Titleholder/PNG Lessee

SNAPSHOT

Transfer liabilities are not applicable to a former petroleum and natural gas lessee due to overriding ownership of pore space by the Crown.

332. As set out above, in Alberta, the Crown owns all pore space in the province in which CO_2 may be injected pursuant to the MMA. As such, the transfer liabilities of a former petroleum titleholder (in Alberta, this would be a petroleum and natural gas lessee) are not applicable in this jurisdiction due to the Crown maintaining title to pore space below the surface of land irrespective of any grant to land or mines or minerals in any land. Any proponent that wishes to inject CO_2 into the said pore space is required to enter an agreement with the Minister. Part 9 of the MMA, which sets out the Agreement Holder's right to apply for a Closure Certificate and transfer liabilities to Alberta upon the issuance of the Closure Certificate, only applies to a lease of pore space from the Crown under a Carbon Sequestration Agreement.

333. Also, in order to generate emission offsets, sequestration credits, or capture recognition tonnes under Alberta's TIER Regulation from a CCS project, there must be permanent geological sequestration of CO_2 into saline aquifers.[148]

Post-closure liabilities

SNAPSHOT

Upon the issuance of a Closure Certificate, Alberta assumes significant long-term responsibilities and liabilities related to actions, claims or damages that occur after the Closure Certificate is issued, but these remain subject to limitations, and there remain certain obligations and liabilities for which Alberta is not responsible, including liability for pre-existing claims or incidents prior to the issuance of the Closure Certificate.

334. Issuance of a Closure Certificate is at the discretion of the Minister. To apply for a Closure Certificate, the Agreement Holder must first fulfill all reclamation and abandonment obligations set out in the legislation, including: (i) completing all closure activities; (ii) abandoning all wells and facilities in accordance with applicable regulations; (iii) reclaiming the CO_2 sequestration lease site and obtaining a reclamation certificate; and (iv) demonstrating to the Minister that all regulatory conditions have been met and that the sequestered CO_2 is stable, predictable, and poses no significant risk of future leakage.[149]

335. Upon the issuance of a Closure Certificate, pursuant to section 120 of the MMA, Alberta assumes significant responsibilities and liabilities related to injected CO_2. Specifically, Alberta becomes the owner of the injected CO_2 and takes on all obligations previously held by the Agreement Holder under various legislation, including the Oil and Gas Conservation Act, the Environmental Protection and Enhancement Act, and the Surface Rights Act. This transfer releases the Agreement Holder from certain obligations tied to the wells used for CO_2 injection.[150] Additionally, upon issuance of the Closure Certificate, Alberta agrees

148 Quantification Protocol for CO_2 Capture and Permanent Storage in Deep Saline Aquifers, version 2.0, Government of Alberta.
149 MMA, s 120(3).
150 MMA, s 121(1)(c).

to indemnify the Agreement Holder against liability for damages in tort actions brought by third parties, provided the liability stems from the Agreement Holder's actions or omissions under the CSA and meets any regulatory conditions. If an Agreement Holder ceases to exist before the Closure Certificate is issued, Alberta may still assume ownership of the injected CO_2 in accordance with regulatory guidelines.[151]

336. Section 121 of the MMA delineates the liability that Alberta assumes from an Agreement Holder on the issuance of a Closure Certificate. While significant, Alberta does not assume all liabilities related to a CCS project without limitation.

337. The Agreement holder will remain responsible and liable for any tortious damages that are classified as "special, incidental, indirect or consequential loss".[152] Despite section 121(2) of the MMA, the Agreement Holder may be barred from recovering tort-related damages from Alberta that are classified as "special, incidental, indirect, or consequential losses or damages" due to the waiver and release contained in the CSA, which provision continues to apply even after the termination of the CSA.[153]

338. Notwithstanding the issuance of a Closure Certificate, the Agreement Holder remains responsible and liable for any claims related to its contractual obligations with clients or other third parties, such as claims of breach of contract. The Agreement Holder also remains responsible and liable for actions, claims and damages that occur before the Closure Certificate is issued. The Crown will only be responsible for long-term liabilities related to actions, claims, or damages that occur after the Closure Certificate is issued[154] - it will not be liable for any pre-existing claims or incidents that took place before that date.[155]

339. Under the MMA, Alberta assumes the obligations of the Agreement Holder solely in its capacity as a "person responsible" under the EPEA. This assumption does not extend to other "persons responsible," such as former owners of the injected CO_2.

340. In terms of the Agreement Holder's license under the OGCA, licensees and/or working interest owners are responsible for the suspension and abandonment of wells or facilities, and abandonment does not release them from ongoing responsibilities or related costs. Non-compliance may result in offences and monetary penalties. Once a Closure Certificate is issued under the MMA, Alberta assumes certain obligations of the Lessee as the owner and licensee of CO_2 injection wells and facilities; however, the former licensee or approval-holder remains liable for any debts owed to the AER, obligations arising before the Certificate was issued, or obligations linked to misrepresentation.[156]

341. The broad indemnities for the Agreement Holder under the CSA survive the termination of the agreement "until the issuance of a closure certificate under the MMA."[157]

151 MMA, s 121(3).
152 CSA Guidelines.
153 MMA, s 121(2); CSA, Article 17.
154 MMA, s 121.
155 CSA Guidelines, PDF 7.
156 CSA Guidelines, PDF 7.
157 CSA, Article 17(2).

Barriers to transfer

SNAPSHOT

All transfers of interest in CSAs require the consent of the Minister, and are subject to a non-exhaustive list of factors including financial and technical requirements.

342. An Agreement Holder can only transfer its interest in the CSA if it obtains the consent of the Minister in writing, which the Minister may withhold, in its sole discretion.[158] There is no jurisprudence in Alberta which provides insight into the circumstances in which consent may be withheld, however certain guidelines exist. A non-exhaustive list of factors the Minister may consider when reviewing an assignment request include whether:[159]

    a. the assignment will result in the project continuing as described in the hub development plan;

    b. the proposed assignee has the ability to take on the CSA and demonstrates the financial ability to take on the CSA and associated operations; and

    c. the proposed assignee is in good standing with the regulator.

158 MMA, s 118.
159 CSA Guidelines, PDF 8-9.

Denmark

Issue	Comment	Risk
Existence and robustness of CCS regime	While the framework is relatively nascent, it provides for clear and robust transfer liabilities for CCS proponents	
Liability split between stakeholders	Liability is only delineated where the current license holder is financially unstable. Legislative amendments are expected to address liabilities for the transition from production to storage	
Post-closure liability	Period of at least 30 years post-closure	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

343. Carbon capture and storage is seen as an important part in meeting Denmark's climate targets. Denmark is estimated to have a very large storage potential of 12 to 22 billion tons of CO_2. This is 400-700 times greater than the annual CO_2 emissions of Denmark.

Transfer liabilities

344. The *Danish Subsoil Act* (**DSA**) governs the licensing regime for exploration and production of hydrocarbons, constructions of pipelines in relation to, as well as licenses for exploration and storage of CO_2 in the Danish subsoil.[160]

345. Liabilities for license holders derive primarily from the DSA, related executive orders and the license. A joint operating agreement (**JOA**) further sets out liabilities between the license holders. As the Danish state will always have a minimum 20% share interest in storage licenses, there will always be more than one participant in Danish storage licenses, and consequently a JOA will always be in place.

346. The DSA governs liability within each license type separately. At present there is no Danish regulation that clearly provides a possibility for applying liability across license types in cases where a reservoir passes from hydrocarbon production to CO_2 storage. However, we are aware that the Danish authorities are currently working on clarifying the liability regime when a reservoir transitions from production to storage. A legislative proposal is expected to be presented in Q3 or Q4 of 2025.

347. The amendments will be expected to specifically address questions of continued usage of installations which originally were used for hydrocarbon production and which will later be used for CO_2 storage.

160 Act No 1461 of 29 November 2023 on Use of the Danish Subsoil.

Current license holders

SNAPSHOT

Upon being granted or after transfer of a storage license, the license holder will be liable for the day-to-day activities under the relevant license. The license holder will be liable for taking all necessary corrective measures in case of significant irregularities or any leakage from the storage. In addition, current license holders will be responsible for any eventual post-closure liabilities, as well as following any instructions given by the Danish authorities.

348. Upon award of a license, the current license holders will be liable for the day-to-day activities under the license.

349. Licensees must take out adequate insurance to cover any liability for damages arising from activities under the license.[161] The Minister for Climate, Energy and Utilities may further order that additional insurance is taken out if it finds that the licensees' original insurance does not provide adequate coverage.

350. Licenses issued in accordance with the DSA may not be assigned to any other party, either directly or indirectly, unless the Minister for Climate, Energy and Utilities allows such an assignment and approves the pertinent terms and conditions.[162] The Danish Energy Agency (**DEA**) has been delegated the authority to act on behalf of the Minister in these cases.

351. As a starting point, the new license holder will, after the transfer has been approved, take over full liability for its share of the license activities and decommissioning costs etc. as set out in the underlying license.

Secondary liability for decommissioning costs in case of transfer

352. In 2015, secondary financial liability was introduced in Denmark in order to mitigate the risk of future licensees being less financially stable than those who previously had been carrying out oil and gas activities in Denmark.[163]

353. A party which wholly or partially, directly or indirectly assigns a license for storage has secondary financial liability towards the remaining license holders.[164] The assignor also has secondary financial liability towards the Danish state if the expenses are not covered by another license holder or if the state has been compelled to take over the decommissioning for the licensee's account.

354. The assignor only retains secondary financial liability for installations which existed at the time of transfer. Pursuant to *the travaux préparatoires* and the guidelines, these installations are defined as "facilities and installations" such as platforms, subsea installations, pipelines, etc. which existed physically and were placed at the site of their use at the time of assignment. However, the definition also includes installations which are in the process of being positioned.

161 DSA, s 24e; Model license for storage of CO_2, section 30.
162 DSA, s 29(1).
163 DSA, s 29a.
164 DSA, s 29a.

355. An assignor cannot become liable for decommissioning costs of facilities which were installed after the time of the transfer. The time of transfer is determined as the point in time the DEA has approved that the transfer will take place in accordance with the terms of the assignment agreement.

356. The assignor's financial liability is limited to its pro rata share of the expenses for carrying out the decommissioning related to the assigned interest share of the license.[165]

357. As the assignor's liability is secondary, the assignor only becomes liable if the assignee has defaulted. All legal rights and options provided in the JOA must have been exhausted before any secondary liability is activated.

358. In case where the same license interest is later assigned by the previous assignee (**Original Assignee**), the liability of the Original Assignee remains, however, the new assignee will become secondarily liable for future decommissioning costs while the original assignor moves down and becomes "tertiarily" liable and so forth with every new assignment. In accordance with the DSA, the remaining licensees as well as the Danish state must first direct any claim towards the last assignor before directing a claim towards a previous assignor if the later assignor defaults on its obligations.

359. The assigning party must enter into an assignment agreement with the remaining licensees dealing specifically with the question of secondary liability. This agreement should be made in accordance with the principles of the decommissioning plans for the license.

360. The DEA has issued guidelines on decommissioning which specifically state that, as part of the economic aspects of the decommissioning plans, licensees are obligated to inform previous licensees about updated information on decommissioning costs and the estimated trigger point for decommissioning as soon as that information is available.

361. The DEA has additionally developed a standard declaration on secondary liability which the assigning licensee must provide to both the Danish state and the remaining licensees.

362. Finally, we note that financial liability for decommissioning costs solely relates to the licensees and not to contractors who may own and lease facilities to the licensees at a reservoir.

Post-closure liabilities

SNAPSHOT

Before transfer of liability to the Minister for Climate, Energy and Utilities the licensee must pay for the expected monitoring cost of the storage site for a period of at least 30 years.

363. The post-closure liabilities and requirements for licensees follow from the CCS Directive,[166] which is implemented in the DSA. Further, the CCS Directive is implemented in the Danish CCS Executive Order (**CCS Executive Order**).[167]

165 DSA, s 29a(3).
166 European Parliament and Council Directive 2009/31/EC of 23 April 2009 on the geological storage of carbon dioxide.
167 Executive Order No 845 of 26 June 2024.

364. A CO_2 storage site can only be closed with the approval of the Minister for Climate, Energy and Utilities.[168] In this regard a CO_2 storage site is eligible for closure if the relevant conditions for the CO_2 storage license are fulfilled, if the licensee has applied for the CO_2 storage site to be closed and if the Minister for Climate, Energy and Utilities has made a decision to withdraw a license for CO_2 storage.[169]

Physical closure of a CO2 storage site

365. Following closure of a CO_2 storage site, the licensee is responsible for sealing the storage site and removing injection facilities.[170] However, it is assumed that the necessary facilities for continued monitoring of the stored CO_2 should remain. This includes that boreholes, which have provided access to the geological formation of the storage site, should not be removed but must be properly sealed.

366. The licensee must prepare a remediation plan for the period after closure of the CO_2 storage site until the transfer of liability takes place. The remediation plan must be approved by the Minister for Climate, Energy and Utilities.[171]

Conditions for transfer of liabilities to the Minister for Climate, Energy and Utilities

367. Once a CO_2 storage site has been closed all legal liabilities regarding the storage site must be transferred to the Minister for Climate, Energy and Utilities either on the Minister's initiative or as per a request from the licensee.[172]

368. The legal liabilities will only be transferred to the Minister for Climate, Energy and Utilities once certain conditions have been fulfilled, namely:

    a. available information must point in the direction that the CO_2 stored at the site will remain completely and permanently stored;[173]

    b. a period of no less than 20 years after the closure of the CO_2 storage site has passed, unless the licensee can demonstrate that the criterion in aforementioned sub-paragraph a has been met before the end of the 20-year period;[174]

    c. the payment obligation stipulated in section 23r(1) of the DSA is fulfilled, which provides that the licensee must make a payment to the Minister for Climate, Energy and Utilities that covers the expected monitoring cost of the CO_2 storage site for a period of at least 30 years (see paragraphs 371 – 373 below);[175] and

    d. the CO_2 storage location is sealed, and the injection facilities have been removed.[176]

369. The aforementioned conditions shall be demonstrated on the basis of a remediation plan prepared by the licensee.[177] The remediation plan shall be prepared according to best practices in the field and in

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168 DSA, s 23k(1).
169 DSA, s 23k(2) no.1-3.
170 DSA, s 23k(3).
171 DSA, s 23l(1).
172 DSA, s 23o(1); CCS Executive Order, s 14(1).
173 DSA, s 23o(1) no. 1.
174 DSA, s 23o(1) no. 2.
175 DSA, s 23o(1) no. 3.
176 DSA, s 23o(1) no. 4.
177 CCS Executive Order, s 14(2).

accordance with Annex 2[178] to the CCS Executive Order. The licensee will first prepare a preliminary remediation plan, which shall be updated if necessary, taking into account risk analysis, best practices and technological improvements. Subsequently, the preliminary remediation shall be submitted to the Minister for Climate, Energy and Utilities for approval, which shall then be approved by the Minister for Climate, Energy and Utilities as the final remediation plan.[179]

370. In addition to the remediation plan, the licensee must submit a report to the Minister for Climate, Energy and Utilities, which demonstrates that available information points in the direction that the CO_2 stored at the site will remain completely and permanently stored.[180] Such report must as a minimum demonstrate that:

a. the injected CO_2's actual behaviour is equivalent to the modelled behaviour;[181]

b. that there is no detectable leakage;[182] and

c. that the CO_2 storage site is evolving towards a state of continuing stability.[183]

Financial contribution for expected monitoring cost post-closure

371. The transfer of liability from the licensee to the Minister for Climate, Energy and Utilities cannot take place before the licensee has paid for the expected monitoring cost for a period of at least 30 years (see paragraph c).[184] In this regard no other cost may be imposed on the licensee after the transfer of liability, unless the licensee has shown negligence or committed fraud.[185]

372. In determining the licensee's payment obligation, the CCS Executive Order[186] states that the licensee's financial contribution must take into account the criteria laid down in Annex 1[187] to the CCS Executive Order, which outlines criteria for assessing a storage complex in three steps:

a. data collection;

b. 3D model building; and

c. dynamic modelling with risk assessment.

In this regard Annex 1 includes a number of data points to be taken into consideration by the licensee and a number of characteristics of a site's surroundings that must be documented in the data collection. On this basis, the licensee must assess the expected monitoring costs for a closed CO_2 storage site for a period of at least 30 years.

373. Alternatively, the licensee's financial contribution must consider elements relating to the historical storage of CO_2 relevant for the determination of the obligations after the transfer of the site to the Minister for

178 CCS Executive Order, Annex 2: Criteria for preparing and updating the monitoring programme referred to in section 11 and for monitoring following decommission.
179 CCS Executive Order, s 14(2).
180 DSA, s 23o(1) no. 1.
181 CCS Executive Order, s 18(2) no. 1.
182 CCS Executive Order, s 18(2) no. 2.
183 CCS Executive Order, s 18(2) no. 3.
184 DSA, s 23r(1).
185 DSA, s 23r(1) and 23s.
186 CCS Executive Order, s 17.
187 CCS Executive Order, Annex 1: Criteria for characterisation and assessment of the potential storage complex and the surrounding area referred to in section 2.

Climate, Energy and Utilities.[188] Neither the DSA nor the CCS Executive Order specify a process for this method of determining the licensee's financial contribution.

Transfer of liabilities to the Minister for Climate, Energy and Utilities

374. Once the Minister for Climate, Energy and Utilities finds that the licensee has demonstrated that the conditions in paragraphs a and b have been fulfilled, the Minister for Climate, Energy and Utilities will prepare a draft decision approving the transfer of liability.[189] The draft decision will specify the method for determining that the CO_2 storage location is sealed and the injection facilities have been removed in accordance with paragraph d. If the Minister for Climate, Energy and Utilities finds that all conditions for transfer are fulfilled, the Minister will provide a final approval and inform the licensee accordingly.[190]

375. Should the Minister for Climate, Energy and Utilities find that the conditions in paragraphs a and b are not fulfilled, the Minister will inform the licensee of their reasons.[191] Such decision from the Minister is an administrative decision eligible for appeal.[192] The relevant body to assess appeals is the Energy Board of Appeal (Energiklagenævnet).[193]

376. Following transfer of liabilities of a CO_2 storage site from the licensee to the Minister for Climate, Energy and Utilities, the Minister is responsible for monitoring and remedial measures, as well as for sealing the storage site and removing the injection facilities. Routine inspections shall in this regard be discontinued and monitoring shall be limited to a level that allows for detection of leakage or significant irregularities. If leakage or significant irregularities are detected, the Minister for Climate, Energy and Utilities shall intensify monitoring to the extent necessary to assess the extent of the issue and the effectiveness of corrective measures.[194] The Minister for Climate, Energy and Utilities may order the former licensee to pay the costs associated with such activities, including by redeeming the financial security stipulated in section 23q of the DSA (see paragraph 385).

Barriers to transfer

SNAPSHOT

Licensees must always be able to demonstrate sufficient technical and financial capacity.

377. The main barrier to transfer is that a license cannot be transferred, directly or indirectly, to others unless the Minister for Climate, Energy and Utilities permits the transfer and approves the terms of the transfer.[195]

378. When the Minister for Climate, Energy and Utilities assess whether a transfer can take place, the Minister will assess whether the new licensee has sufficient technical and financial capacity. This is due to the fact that holders of a license issued in accordance with the DSA must at all times have the sufficient technical and financial capacity to carry out their license activities in a manner which will benefit society as much as

188 CCS Executive Order, s 17.
189 CCS Executive Order, s 19(1).
190 CCS Executive Order, s 19(3).
191 CCS Executive Order, s 19(2).
192 DSA, s 37a(1).
193 DSA, s 37a(4).
194 CCS Executive Order, s 14(4).
195 DSA, s 29(1).

possible while also providing the public as much insight into the activities as possible.[196] If a new licensee cannot demonstrate sufficient technical and/or financial capacity, the Minister for Climate, Energy and Utilities may refuse to transfer the license.[197]

379. The Minister for Climate, Energy and Utilities may at any point in time request the licensee to document that the licensee in fact has the sufficient technical and financial capacity to carry out their license activities. If a licensee cannot document that it has sufficient technical and/or financial capacity, the Minister for Climate, Energy and Utilities may issue an order requiring that the matter is remedied within a specified period. An order may also be issued by Minister for Climate, Energy and Utilities to completely or partially cease the license activities.[198]

Technical Capacity

380. The requirement of sufficient technical capacity entails that a licensee must have sufficient technical capacity to operate the business in a reasonable manner and must be able to handle unforeseen events in a safe and secure manner. The licensee must, amongst others, have the necessary technical capacity to ensure proper preparation, immediate implementation and uninterrupted continuation of all measures necessary for effective emergency response and subsequent remediation.[199]

381. In documenting sufficient technical capacity, a licensee may be asked by the Minister for Climate, Energy and Utilities to submit information about its organisation for carrying out activities in connection with the license, the professional competencies of the licensee's employees and documentation of the licensee's previous experience with similar activities.

Financial Capacity

382. As previously stated, the licensee will also have to demonstrate financial capacity. The requirement of sufficient financial capacity entails that a licensee shall have sufficient funds to carry out all activities included in the license, including a reserve for unforeseen expenses and financial security to cover potential liability arising from the activities.[200] It is usually a requirement that the licensee's net equity is positive and in reasonable proportion to the size of the balance sheet. Further, the licensee's cash flow must be reasonable in relation to the level of activity.

383. In documenting sufficient financial capacity, a licensee may be asked by the Minister for Climate, Energy and Utilities to submit the licensee's previous annual reports. If the licensee is a part of a group of companies, the Minister for Climate, Energy and Utilities may also request that the parent company submits previous annual reports as well as an organisation chart that illustrates which company in the group that is licensee. Finally, the Minister for Climate, Energy and Utilities may also request annual reports of the company who shall provide financial security (see paragraphs 385 – 386).

196 DSA, s 24a(1).
197 DSA, s 29(2).
198 DSA, s 24c(1) and (2).
199 DSA, s 24a(2).
200 DSA, s 24a(3).

Foreign Direct Investments

384. In addition, it should also be considered whether the Danish Investment Screening Act (**DISA**) applies in terms of assignment agreement related to the transfer of the license, including whether a mandatory filing requirement under the DISA applies, in which case the transfer must not be binding before prior authorization is obtained from the Danish Business Authority (**DBA**).[201] The procedure for FDI authorization under the DISA is divided into two phases:

a. Phase 1: Begins once the DBA declares the foreign contracting party's application for authorization *complete* and it must be concluded within 45 calendar days. A Phase 1 screening may result in (i) authorization; (ii) cancellation (if the DBA conclude that the Danish target is not operating within the particularly sensitive sectors and activities); or (iii) opening of Phase 2 proceedings.

b. Phase 2: If the DBA cannot approve the transaction within the prescribed deadline for Phase 1 - but sees a need for further investigation - it will initiate Phase 2 proceedings. It may demand further information from the foreign contracting party, and Phase 2 will not begin until the DBA has declared that all the requested information has been submitted. Phase 2 must be concluded within 125 calendar days from when the in-depth investigation was initiated. A Phase 2 screening may result in (i) authorization; (ii) a decision to negotiate terms with the foreign contracting party; or (iii) the application being submitted to the Minister of Industry Business and Financial Affairs for a final decision. There is no formal deadline for the Minister's review. Approval may be granted subject to commitments made by the foreign contracting party to alleviate the concerns of the DBA or the Minister.

Financial Security

385. Another barrier to transfer is that a licensee must provide financial security equivalent to the estimated costs of all obligations arising from the CO_2 storage license. The financial security may be adjusted regularly to take into account changes in the assessed risk of leakage and detected irregularities.[202] The financial security must be valid and effective before injection into a CO_2 storage site commences. Further, the financial security must be valid and in force after closure of a CO_2 storage site and until the liabilities have been transferred from the licensee to the Minister of Climate, Energy and Utilities.[203]

386. A licensee can provide financial security in the form of a parent company guarantee, if the licensee's financial situation provides basis for this. This can, for example, be documented by a satisfactory rating from a recognized rating company, such as Standard & Poor's, Moody's and Fitch Ratings. Alternatively, a licensee can provide financial security by insurance, a bank guarantee or similar.[204]

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201 Consolidated Act No.1256 of 27 October 2023 on screening of foreign investments.
202 DSA, s 23q(1).
203 DSA, s 23q(1) and (2).
204 CCS Executive Order, s 17(1).

Australia – Commonwealth

Issue	Comment	Risk
Existence and robustness of CCS regime	Comprehensive liability regime, however broad and relatively untested directions powers accorded to Regulator	
Liability split between stakeholders	Regime clearly delineates liability between various proponents however does not expressly indicate priority where two proponents are liable to undertake the same activity	
Post-closure liability	Minimum period of 15 years post obtaining a site closing certificate	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

387. Liabilities for the transfer of greenhouse gas titles under the Australian federal regime are primarily governed under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (**OPGGSA**) and its associated regulations.

388. The OPGGSA prescribes a directions based liability framework for current or future greenhouse gas storage operations, which extends to former greenhouse gas titleholders, current greenhouse gas titleholders and previous petroleum titleholders. Under this regime, the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) or the responsible Commonwealth Minister are authorised to direct parties to undertake various activities. These directions include general directions relating to broad greenhouse gas matters, remedial directions where a serious situation has occurred, remedial directions for the remediation and decommissioning of a greenhouse gas storage operation, and the eventual site-closure directions and post-closure directions.

389. Transfer liability applies throughout the entirety of a greenhouse gas storage operation, until 15 years after the storage operations have ceased. At this point in time, the Commonwealth government may indemnify titleholders for all liability relating to the greenhouse gas storage operations.

390. Further, while the OPGGSA does contemplate the delineation of liability between former and current CCS titleholders (e.g. only current titleholder is liable for day-to-day activities, post-closure liabilities), it is unclear on priority where both a former and current titleholder may be liable (e.g. it is unclear in what circumstances a former titleholder will be liable for remedial work over the current titleholder). There is also no concept of title conversion. A petroleum titleholder will be required to apply for a greenhouse gas title regardless if operations will be undertaken on the same offshore area.

391. Lastly, there are potential commercial and transaction barriers to transferring a greenhouse gas title. These range from legislative barriers, such as prescribed criteria for the transferee and the Foreign Investment Review Board (**FIRB**) approval where the transferee is a foreign entity, and practical barriers that may arise in respect of each transaction subject to the project strategy and surrounding facilities and assets.

Transfer liabilities

SNAPSHOT

Transfer liability under the Commonwealth CCS regime is largely driven by directions-based liability. Directions can be issued to current titleholders, former titleholders, and previous petroleum titleholders throughout the various stages of the greenhouse gas storage operation, and include remedial and post closure liabilities.

392. Under the OPGGSA, transfer liability largely derives from the various directions powers afforded to both NOPSEMA or the responsible Commonwealth Minister to direct a person to undertake certain activities.

393. A transfer of greenhouse gas title will not absolve a former titleholder from all liability under the title. The legislative regime ensures that current and former titleholders, and "certain other persons" will be liable for directions to undertake various activities including decommissioning and remedial work. We set out below transfer liabilities for: (1) current titleholders; (2) former titleholders; and (3) previous petroleum titleholders, relating to the current or future greenhouse gas storage operations.

Current Titleholders

SNAPSHOT

Upon transfer of a greenhouse gas title, the titleholder will be liable for the day-to-day activities under the relevant title. They will further be liable for any "serious situations" and eventual post closure liabilities, as well as broad general directions and remedial directions.

394. Upon the transfer of title, the current titleholder will be solely liable for the day-to-day activities under the relevant title.

395. Further, the current titleholder may be liable to undertake various activities relating to the title, pursuant to NOPSEMA or the responsible Commonwealth Minister's "serious situations" directions power, general directions power or remedial directions power.

396. Where a serious situation in relation to a greenhouse gas storage operation has occurred (e.g. leakage of a greenhouse gas substance),[205] the responsible Commonwealth Minister may direct the current titleholder to undertake activities for the purpose of eliminating, mitigating, managing, or remediating the serious situation.[206] A breach of this direction constitutes an offence, and the breaching party will be liable for a prescribed penalty.[207]

    It is important to note that that OPGGSA does not contemplate who causes the serious situation, only who the current titleholder is. For example, if a greenhouse gas leakage was ultimately caused by a

205 OPGGSA, s 379(1)(a). Further examples include where the greenhouse gas has or is behaving otherwise than as predicted in the site plan, where the greenhouse gas will have a significant adverse risk on the geotechnical integrity of a geological structure, or where the greenhouse gas storage formation is not suitable permanent storage.

206 OPGGSA, s 380(1)(f).

207 OPGGSA, s 382.

latent defect of the previous titleholder, a "serious situations" direction can still only be made against the current titleholder.

397. Throughout the lifespan of a greenhouse gas storage operations, NOPSEMA or the responsible Commonwealth Minister have broad discretionary powers to issue general directions to current titleholders.[208] Such directions may relate to:[209]

a. the injection, storage and carrying of operations of greenhouse gas substances;

b. the restoration or maintenance of the geological formation for permanent storage of greenhouse gas substances;

c. the clean-up or other remediation of the effects of the escape of greenhouse gas substances;

d. the prevention of damage to petroleum-bearing strata;

e. the keeping separate of each petroleum pool discovered in a greenhouse gas title from each source of water discovered;

f. the prevention of waste or escape of greenhouse gas substance from greenhouse gas infrastructure;

g. the maintenance and repair of all structures, equipment and property in an offshore area for the purpose of greenhouse gas storage operations;

h. the removal of structures, equipment and property relating to the greenhouse gas storage operations; and

i. the decommissioning of structures, equipment and property relating to the greenhouse gas storage operations,

where a breach of such direction constitutes an offence liable for a prescribed penalty.[210]

398. The current titleholder may also be subject to remedial directions. NOPSEMA or the responsible Commonwealth Minister can issue remedial directions to current titleholders to undertake various remedial or decommissioning activities relating to the greenhouse gas storage operations including:[211]

a. removal of all property from the title area;

b. plug or close off all wells in the title area;

c. provide for the conservation and protection of natural resources in the title area; and

d. make good any damage to the seabed or subsoil in the title area.

Similar to general directions, remedial directions may be issued at any point in time during the lifecycle of the greenhouse gas operations, and a breach constitutes an offence liable for a prescribed penalty.[212]

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208 OPGGSA, ss 579A(2), 580(2).
209 OPGGSA, s 782(1).
210 OPGGSA, s 582.
211 OPGGSA, ss 591B(2), 592(2), 594A(2), 595(2).
212 OPGGSA, ss 591B(5), 592(5), 594A(6), 595(6).

399. Current titleholders are further subject to various site-closure liabilities and post-closure liabilities once greenhouse gas operations have ceased. This includes directions to the current titleholder to undertake remedial activities as outlined in paragraph 398, as well as the following activities:

a. monitoring of the behaviour of the greenhouse gas substance;[213]

b. eliminating, mitigating, managing or remediating the risk that a greenhouse gas substance will have a significant adverse impact on navigation, fishing, activities relating to the construction or operation of a pipeline, enjoyment of native title rights, conservation or exploitation of natural resources, geotechnical integrity of the geological formation / structure, the environment, or human health or safety;[214] and

c. ensuring or increasing the likelihood that a greenhouse has substance will behave as predicted in the approved site plan.[215]

Former Titleholders

SNAPSHOT

Upon transfer of a greenhouse gas title, the former titleholder will be liable for remedial or decommissioning directions.

400. Upon the transfer of a greenhouse gas title, the former titleholder relinquishes liabilities around the day-to-day operations of the title, with such liabilities falling on the current titleholder. However, former titleholders are still liable for remedial or decommissioning activities pursuant to remedial directions as described in paragraph 398. We note that it is unclear as to the circumstances in which a former titleholder will be required to undertake remedial or decommissioning activities in priority over the current titleholder. This is largely at the discretion of NOPSEMA or the responsible Minister.

401. Further, former titleholders may be liable under the trailing liability provisions of the OPGGSA which extends liability past current and former titleholders. Trailing liability will be applicable throughout the lifespan of the title, until the title ceases to exist. The OPGGSA's trailing liability regime allows the responsible Commonwealth Minister to direct the following parties to undertake various remedial or decommissioning obligations:[216]

a. a person who is capable, or has significantly benefited financially from the operation of the title;

b. a person who is in the position to influence the way in which the titleholder complies with their obligations under the Act; and

c. a person who acts or acted jointly with the titleholder or former titleholder in relation to the operations of the title.

213 OPGGSA, s 593(2)(e).
214 OPGGSA, s 593(2)(f).
215 OPGGSA, s 593(2)(g).
216 OPGGSA, ss 591B(2B), 592(2B), 594A(2B), 595(2B).

402. We note that it is not expressly stated in the OPGGSA when a former titleholder may be subject to the trailing liability provisions. However, online guidance from NOPSEMA indicates that the trailing liability provisions would be used "*where a current titleholder has failed to decommission in accordance with regulatory requirements, (such as the current titleholder entering liquidation)*".[217]

403. Former titleholders will not be liable for any site-closure liabilities or post-closure liabilities once it has transferred title.

Former Petroleum Titleholders

SNAPSHOT

While remedial directions only apply to former greenhouse gas titleholders, former petroleum titleholders may be subject to remedial liability under the broad general directions power and trailing liability regime

404. Under the OPGGSA, there is no process for the conversion of one title (i.e. a petroleum title) to another title (i.e. a greenhouse gas title). An applicant must make an application to the responsible Commonwealth Minister if they wish to obtain a greenhouse gas title,[218] even if they currently hold the petroleum title for the same offshore area.[219] The implication of this process is that from a strict reading of the OPGGSA, a former petroleum titleholder is not considered a "former titleholder" for the purposes of the relevant greenhouse gas storage operations.

405. However, former petroleum titleholders may be liable under the trailing liability provisions of the OPGGSA. Please see paragraphs 401 – 402 which equally apply to former petroleum titleholders. As such, a former petroleum titleholder must be aware that a former titleholder may be liable for remedial directions if they satisfy any of the above categories described in paragraph 401.

406. Further, the general directions power, as described in paragraph 397, can also apply to any person who is:[220]

a. in an offshore area for any reason touching, concerning, arising out of, or connected with, a greenhouse gas storage operation; or

b. in, on, above, below or in the vicinity of a structure, installation, equipment or property, that is in the offshore area for the purpose of a greenhouse gas storage operation.

407. Former petroleum titleholders should be aware that they may still be liable under broad directions powers as long as they are within the vicinity of the greenhouse gas storage operation.

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217 See NOPSEMA announcement "The Regulator 2022 – Issue 2".
218 See, eg, OPGGSA, ss 361, 369.
219 OPGGSA, ss 369, 373.
220 OPGGSA, ss 579A(3)(b), 580(3)(b).

Comparison

408. For ease of reference, we set out below a comparison of transfer liabilities for: (1) current titleholders; (2) former titleholders; and (3) former petroleum titleholders, relating to the current or future greenhouse gas storage operations.

Liability	Current Titleholder	Former Titleholder	Former Petroleum Titleholder
General directions	✓	?	?
Serious situation directions	✓	x	x
Remedial directions	✓	✓	x
Remedial trailing liability	✓	✓	?
Site-closure and post-closure	✓	x	x

Post-closure liabilities

SNAPSHOT

The Commonwealth will indemnify the greenhouse gas titleholder holder after a minimum period of 15 years post obtaining a site closing certificate (obtained once all operations of injection have ceased).

409. Under the OPGGSA, the current greenhouse gas titleholder is liable for the monitoring and maintenance activities of the injection site post-site closure.[221]

410. Where the operations for the injection of greenhouse gas substances have ceased, the current titleholder must make an application for a site closing certificate.[222] The responsible Commonwealth Minister may then issue various site closing directions relating to the monitoring and maintenance of the injection site.[223] The current titleholder will be liable for the injection site for at least 15 years post obtaining a site closing certificate.[224]

221 OPGGSA, s 593.
222 OPGGSA, s 386(4).
223 OPGGSA, s 593(2).
224 OPGGSA, s 399(1)(c).

411. After 15 years have lapsed, the responsible Commonwealth Minister may declare a closure assurance period,[225] after which the Commonwealth will indemnify the greenhouse gas titleholder against the following:[226]

    a. liability for damages;

    b. liability attributable to an act done or omitted to be done in the carrying out of operations authorised by the license in relation to the formation;

    c. liability incurred or accrued after the end of the closure assurance period in relation to the formation; and

    d. such other conditions as are specified in the regulations.

412. A closure assurance period may only be declared where the responsible Commonwealth Minister is satisfied that there is no significant risk that the injected greenhouse gas will have a significant adverse impact on the geotechnical integrity of the geological structure, the environment, or human health or safety.[227]

Barriers to transfer

SNAPSHOT

All transfer of titles will be subject to legislative and non-legislative barriers (e.g. financial and technical requirements of transferee, regulatory reviews).

413. There are various legislative and non-legislative barriers to transfer of a greenhouse gas title under the Commonwealth regime.

Legislative Barriers

414. Under the OPGGSA, a greenhouse gas titleholder cannot transfer its title without approval by the Titles Administrator.[228] In deciding whether to approve a transfer, the Titles Administrator may have regard to various matters including:

    a. whether the transferee has adequate technical advice and financial resources available to carry out operations under the title and discharge any obligations under the title;[229]

    b. where the transferee is an individual, the individual's experience in the injection or storage of greenhouse gas substances;[230]

225 OPGGSA, s 399(1).
226 OPGGSA, s 400.
227 OPGGSA, s 399(1)(c).
228 OPGGSA, s 524(a).
229 OPGGSA, s 529(2C)(a).
230 OPGGSA, s 695YB(2)(a)(ii).

c. where the transferee is a corporation, the corporation's officer's experience in the injection or storage of greenhouse gas substances;[231] or

d. whether the transferee has been found guilty of an offence under Australian law.[232]

415. There are further barriers for transfer pursuant to the OPGGS Regulations in the event there is a change in titleholder with operational control of the injection site. These include:

a. under the OPGGS Safety Regulations, a new safety case is required if there is a replacement of operator.[233] Only the existing operator may submit a new safety case,[234] and once submitted, NOPSEMA have 90 days to accept, reject or accept, with conditions;[235]

b. under the OPGGS Resource Management Regulations, a change in operator will result in a change in the manner in which the risks to the integrity of the injection site are managed.[236] As such, an existing titleholder must submit a revised well operations management plan to NOPSEMA for approval, prior to the transfer of title;[237] and

c. under the OPGGS Environment Regulations, a change in operator will result in a change in the manner in which the environmental impacts and risks of an activity of the injection site are managed.[238] As such, an new titleholder must submit a revised Environment Plan to NOPSEMA for approval, as soon as practicable after becoming the new titleholder.[239]

416. Where the transferee is a foreign entity, the transfer may also be subject to approval from the Foreign Investment Review Board (**FIRB**). FIRB approval, which is regulated under the *Foreign Acquisitions and Takeovers Act 1975* (Cth) (**FATA**), will be required where a transfer of title is considered to be contrary to the "national interest" or "national security" of Australia. If the transfer is considered contrary, the Treasurer can make an order prohibiting the transfer.[240] Further, criminal and civil penalties can apply for transferees failing to obtain FIRB approval prior to transfer of title.[241]

417. As previously noted, CCS projects are relatively new in Australia, and as such, and from our experience, the Australian regulator's appetite for approval is relatively untested.

231 OPGGSA, s 695YB(2)(b)(ii).
232 OPGGSA, ss 695YB(2)(c), (d), (e), (f), (i), (j), (m), (n).
233 OPGGS Safety Regulations, r 2.24.
234 OPGGS Safety Regulations, r 2.24(1).
235 OPGGS Safety Regulations, r 2.27.
236 See NOPSEMA Guidance Note "Change to the titleholder with operational control of activities", 7.
237 OPGGS Resource Management Regulations, r 5.10(2).
238 See NOPSEMA Guidance Note "Change to the titleholder with operational control of activities", 7.
239 OPGGS Environment Regulations, r 39(3).
240 FATA, ss 67(1), (1A).
241 FATA, s 85.

Additional observations of relevance

418. For completeness, we note that other legislation that may have relevance to management and transfer of reservoir licenses and liability with respect to CO_2 storage projects occurring in the offshore jurisdiction of the Commonwealth include the following:

a. the *Environment Protection (Sea Dumping) Act 1981* (Cth) **(Sea Dumping Act)**, which requires a person who proposes to store CO_2 in an offshore reservoir to obtain a permit and is the key piece of legislation that Australia has to give effect to its obligations under the London Protocol; and

b. the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**), which requires a person to obtain an approval for the storage of CO_2 in an offshore reservoir where that action has, will have or is likely to have a significant impact on a protected matter of national environmental significance to Australia.

419. The Sea Dumping Act creates a series of offences for dumping or incineration of "controlled material" (including CO_2 for geosequestration) in Australian waters, as well as for loading / export of "controlled material" (including CO_2 for geosequestration) in Australian waters where such activities are carried out without a permit or otherwise not in accordance with the terms of a permit.[242] The relevant persons who engage in such activities are the ones who face potential exposure to offences in the absence of a permit or observing the conditions of the permit.

420. The Sea Dumping Act does not contain an express provision in it that allows for transfer of a permit. In the absence of such a provision, where a person undertaking a CO_2 storage activity proposes to transfer an asset (e.g. CO_2 storage project), that person would either need to obtain a new permit or, arguably, could seek a variation of the existing proponent's permit to change the holder of the permit.[243] The Minister has power to unilaterally vary, suspend or revoke a permit at any time where satisfied that the Sea Dumping Act (or a provision of a permit) has been breached or it is necessary or expedient to do so in order to properly regulate the activities with which the Sea Dumping Act is concerned.[244]

421. Where the Minister considers that any activity regulated by the Sea Dumping Act is likely to cause obstructions or danger to vessels, result in harm to human or marine life, or interfere with the exercise of Australia's sovereign rights, the Minister can take such steps as considered proper to repair, remedy or mitigate the situation.[245] If the person responsible for causing such a situation is convicted of an offence under the Sea Dumping Act, the costs / expenses incurred by the Commonwealth in repairing, remedying or mitigating the situation are recoverable as a debt due to the Commonwealth by action in a court of competent jurisdiction.[246]

422. The EPBC Act likewise creates a series of offences for undertaking an action that has, will have or is likely to have a significant impact on a protected matter of national environmental significance to Australia in the absence of an approval or observing the conditions of an approval.[247]

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242 See Sea Dumping Act, ss 10A, 10B, 10C, 10D and 15.
243 Sea Dumping Act, ss 18 and 23.
244 Sea Dumping Act, ss 20 and 21.
245 Sea Dumping Act, s 16.
246 Sea Dumping Act, s 17.
247 EPBC Act, ss 15A, 15C, 17B, 18A, 20A, 22A, 24A, 24C, 24E.

423. The EPBC Act contains an express provision that allows for the transfer of an approval with the Minister's consent. The effect of the consent is that the EPBC Act operates in relation to the transferor as if the Minister had revoked the approval when the Minister's consent took effect; and, in relation to the transferee, as if the Minister had approved the taking of the action by the transferee and had attached to the approval the same conditions that bound the transferor from the date of the Minister's consent onwards. In deciding whether to consent to the transfer, the Minister may consider whether the transferee would be a suitable person to be granted the approval having regard to the transferee's history in relation to environmental matters; and whether the transferee can comply with the conditions of the approval.[248] The Minister may unilaterally revoke, vary or add to any conditions of an approval,[249] as well as suspend an approval for a specified period on the grounds of a contravention of an approval condition,[250] or revoke an approval on the grounds that a significant impact on a matter of national environmental significance has occurred because of a contravention of an approval condition.[251]

424. If the Minister suspects that an act or omission constitutes a contravention of the EPBC Act or its regulations, the Minister may, amongst other things, take such steps as the Minister thinks proper to mitigate any environmental damage that arises from the act or omission.[252] A person who contravenes the EPBC Act or its regulations is liable to pay to another person, including the Crown, who suffers loss or damage arising from the contravention, an amount equal to the other person's loss or damage, including any expenses incurred in mitigating environmental damage arising from the act or omission.[253]

248 EPBC Act, s 145B.
249 EPBC Act, s 143.
250 EPBC Act, s 144.
251 EPBC Act, s 145.
252 EPBC Act, s 499.
253 EPBC Act, s 500.

Australia – Victoria (Offshore)

Issue	Comment	Risk
Existence and robustness of CCS regime	Comprehensive liability regime that mimics the Australian Commonwealth regime	
Liability split between stakeholders	Regime clearly delineates liability between various proponents however does not expressly indicate priority where two proponents are liable to undertake the same activity	
Post-closure liability	Does not include post-closure requirements	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

425. In Victoria, offshore greenhouse gas storage titles are primarily governed by the following legislation:

    a. *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) (**OPGGSA (Vic)**); and

    b. *Offshore Petroleum and Greenhouse Gas Storage Regulations 2021* (Vic) (**OPGGS Regulations (Vic)**),

    (collectively, the **Victorian Offshore CCS Legislation**).

426. Identical to the Commonwealth OPGGSA, the Victorian Offshore CCS Legislation prescribes a directions based liability framework for current or future greenhouse gas storage operations, which extends to former and current greenhouse gas titleholders. The main point of difference is the lack of trailing liability which may extend liability to former petroleum titleholders on the same title location.

427. Under the Victorian regime, the State Minister is authorised to direct parties to undertake various activities. These directions include general directions relating to broad greenhouse gas matters, remedial directions where a serious situation has occurred, remedial directions for remediation and decommissioning of a greenhouse gas storage operation, and the eventual site-closure and post-closure directions.

428. A further difference between with Victorian regime and the Commonwealth regime is the lack of post-closure requirements. At the end of the greenhouse gas storage operation lifespan, the titleholder is still required to apply for a site closing certificate, however there is no concept of “post closure” and the State Government does not indemnify the titleholder of liability.

429. Identical to the Commonwealth OPGGSA, the Victorian regime does not delineate liability between former and current titleholder. This means that for liability that applies to both former and current titleholders, it is up to the discretion of the State Minister to decide where the liability lies.

430. Lastly, there are potential commercial and transaction barriers to transferring a greenhouse gas title. These range from legislative barriers, such as prescribed criteria for the transferee, to practical barriers that may arise in respect of each transaction subject to the project strategy and surrounding facilities and assets.

Transfer liabilities

431. The Victorian Offshore CCS Legislation is largely identical to the Commonwealth OPGGSA, with the transfer liability largely deriving from various requirements / directions. However, the main difference is that the Victorian regime does not include a trailing liability regime.

432. We set out below transfer liabilities for: (1) current titleholders; (2) former titleholders; and (3) previous petroleum titleholders, relating to the current or future greenhouse gas storage operations.

Current Titleholders

SNAPSHOT

Upon transfer of a greenhouse gas title, the titleholder will be liable for the day-to-day activities under the relevant title. They will further be liable for any "serious situations" and eventual post closure liabilities, as well as broad general directions and remedial directions.

433. Under the Victorian regime, the transfer liabilities for a current titleholder are identical to the Commonwealth regime. Throughout the lifespan of a greenhouse gas storage operation, the State Minister may direct the current titleholder to undertake various activities relating the title through the following directions powers:

a. the "serious situations" directions powers[254] (see paragraph 396);

b. the general directions powers[255] (see paragraph 397);

c. the remedial directions powers[256] (see paragraph 398); and

d. the site closing directions[257] (see paragraph 399).

Former Titleholders

SNAPSHOT

Upon transfer of a greenhouse gas title, the former titleholder will be liable for remedial or decommissioning directions.

434. Identical to the Commonwealth OPGGSA, former titleholders under the Victorian regime will remain liable for remedial activities post transferring a greenhouse gas storage title.[258] See paragraph 401, which details the remedial activities a former titleholder may be directed to undertake.

254 OPGGSA (Vic), s 406.
255 OPGGSA (Vic), s 629.
256 OPGGSA (Vic), s 640.
257 OPGGSA (Vic), s 641.
258 OPGGSA (Vic), s 643.

Former Petroleum Titleholders

SNAPSHOT

Former petroleum titleholders are not considered "former titleholders" for a greenhouse gas title. As such, they are absolved from liability upon the surrender of their petroleum title.

435. Under the OPGGSA, there is no process for the conversion of one title (i.e. a petroleum title) to another title (i.e. a greenhouse gas title). An applicant must make an application to the State Minister if they wish to obtain a greenhouse gas title,[259] even if they currently hold the petroleum title for the same offshore area.[260] The implication of this process is that a former petroleum titleholder is not considered a "former titleholder" for the purposes of the relevant greenhouse gas storage operations.

436. Where the Victoria Offshore CCS Legislation differs from the OPGGSA is that the Victoria Offshore CCS Legislation does not include a trailing liability provision that could potentially extend liability to former petroleum titleholders.

Comparison

437. For ease of reference, we set out below a comparison of transfer liabilities for: (1) current titleholders; (2) former titleholders; and (3) previous petroleum titleholders, relating to the current or future greenhouse gas storage operations.

Liability	Current Titleholder	Former Titleholder	Former Petroleum Titleholder
General directions	✓	?	?
Serious situation directions	✓	x	x
Remedial directions	✓	✓	x
Remedial trailing liability	N/A	N/A	N/A
Site-closure and post-closure	✓	x	x

Post-closure liabilities

SNAPSHOT

Similar to the Commonwealth OPGGSA, the Victorian regime prescribes an equivalent requirement for a greenhouse gas titleholder to apply for a site closing certificate post storage operations. However, the Victorian regime does not include post-closure requirements, nor does the State Government indemnify the titleholder of liability.

259 See, eg, OPGGSA (Vic), ss 379, 392.
260 OPGGSA (Vic), ss 392, 398.

438. The OPGGSA (Vic) has the equivalent requirements as the Commonwealth OPGGSA for a greenhouse gas titleholder to apply for a site closing certificate. See paragraphs 409 to 410.

439. However, the Victorian regime differs in that the OPGGSA (Vic) does not prescribe post-closure regime after a titleholder has obtained a site closing certificate. After a titleholder obtains a site closure certificate, any costs or expenses incurred reasonably by the State in carrying out the program specified in the site closing certificate is a debt payable by the holder of the site closing certificate.

440. The Victorian Offshore CCS Legislation does not contemplate a mechanism to require the State Government to indemnify the titleholder for any liability post obtaining a site closure certificate.

Barriers to transfer

SNAPSHOT

All transfer of titles will be subject to legislative and non-legislative barriers (e.g. financial and technical requirements of transferee, regulatory reviews).

441. There are various legislative and non-legislative barriers to transfer of a greenhouse gas title under the Victorian regime.

Legislative Barriers

442. Under the OPGGSA (Vic), a greenhouse gas titleholder cannot transfer its title without approval by the State Minister. Any transfer application where the transferee(s) is not a registered holder of the title will require a document setting out:

a. the technical qualifications of the transferee(s);

b. details of the technical advice that is or will be available to the transferee(s); and

c. details of the financial resources that are or will be available to the transferee(s).

443. There are further barriers for transfer pursuant to the OPGGS Regulations (Vic) in the event there is a change in titleholder with operational control of the injection site. The requirement to submit a new environmental plan,[261] safety case,[262] and well operations management plan[263] are substantially equivalent to the approach under the OPGGSA. See paragraph 415.

444. As described in the Commonwealth section, where the transferee is a foreign entity, the transfer may be subject to approval from FIRB. Please see our analysis at paragraph 416.

261 OPGGS Regulations (Vic), r 20(4).
262 OPGGS Regulations (Vic), r 68.
263 OPGGS Regulations (Vic), r 233.

Australia – Victoria (onshore)

Issue	Comment	Risk
Existence and robustness of CCS regime	Comprehensive onshore regime focusing solely on existing holder of CCS license, however, untested	
Liability split between stakeholders	Regime focuses mainly on existing license holder, with liability extended to former holders in clear exceptional circumstances only	
Post-closure liability	Upon surrender, the license holder must, before surrendering the license, pay the remaining cost of carrying out long-term monitoring and verification	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

445. In Victoria, **onshore** greenhouse gas storage titles (called "authorities" in that State) are primarily governed by the following legislation (**onshore legislation**):

    a. *Greenhouse Gas Geological Sequestration Act 2008* (Vic) (**GGGS Act**); and

    b. *Greenhouse Gas Geological Sequestration Regulations 2019* (Vic) (**GGGS Regulations**).

446. According to the GGGS Act,[264] the onshore legislation does not apply to an underground geological storage formation that is within the area defined by s 4(3) of the OPGGSA (Vic) as the "offshore area".

447. Similarly to the Commonwealth OPGGSA, the GGGS Act generally uses a requirements / directions based liability framework for regulating greenhouse gas storage operations. Under this regime, the responsible Minister is authorised to direct parties to undertake various activities, including in respect of remediation where a serious situation has occurred. However, the main difference between the Victorian onshore regime and the Commonwealth regime is that the GGGS Act focuses almost entirely on the current authority-holder's liability and only exceptionally extends liability to former titleholders.

448. Under the GGGS Act, the relevant Minister may grant an authority subject to any conditions that the Minister considers to be appropriate, including concerning the rehabilitation of any land affected by operations under the authority.[265] The Minister may also unilaterally vary conditions imposed on certain authorities.[266]

449. There is no process for conversion of a petroleum title to a greenhouse gas storage title. There is no trailing liability imposed under the GGGS Act.

264 GGGS Act, s 11.
265 GGGS Act, s 157.
266 GGGS Act, s 159.

Transfer liabilities

SNAPSHOT

The main difference between the Victorian onshore legislation and the Commonwealth regime is that the GGGS Act focuses almost entirely on the current authority holder's liability and only exceptionally extends liability to former authority holders.

Current Titleholders

450. Similarly to the Commonwealth OPGGSA, transfer liability under the GGGS Act largely derives from various directions powers afforded to the relevant Minister, including the following:

a. require the holder of any authority to take all reasonable steps to respond to a "serious situation",[267] including by undertaking the activities specified in the direction for the purposes of eliminating, mitigating or remedying the serious situation;[268]

b. cancel an authority on one or more of several grounds, including that the conditions of the authority have not been complied with, that any activity carried out under the authority has caused a "serious situation"[269] or, in the case of an injection and monitoring license, that no greenhouse gas substance has been injected over a period of two years;[270]

c. require the holder of any authority to obtain and maintain insurance against expenses or liabilities in connection with the carrying out of operations under the authority, including the remedying of the effects of the escape of a greenhouse gas substance;[271]

d. in relation to a rehabilitation bond, which is compulsory for any greenhouse gas sequestration operation (in an amount specified by the Minister),[272] the Minister may require the holder of the relevant authority to obtain an extension of the rehabilitation bond, or obtain a further rehabilitation bond for an amount determined by the Minister;[273]

e. excise an area from an authority if the Minister is satisfied that no operations have been carried out in that area in accordance with the authority-holder's work program in the last two years and that the excision of the identified area will not interfere with the ongoing operations of the authority holder;[274] and

f. require any person who is entitled to carry out injection and monitoring operations to enter into a co-operative arrangement in order to maximise the volume of the greenhouse gas stored in an area.[275]

Former Titleholders

451. Victoria's onshore legislation only exceptionally extends liability to former titleholders. The exceptions are highlighted in the post-closure liabilities section below.

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267 Defined at GGGS Act, s 6.
268 GGGS Act, ss 182-183.
269 GGGS Act, s 175.
270 GGGS Act, s 176(b).
271 GGGS Act, s 218.
272 GGGS Act, s 220.
273 GGGS Act, s 221(2).
274 GGGS Act, ss 180(1)(a)-(b).
275 GGGS Act, s 119(2)(b).

Former Petroleum Titleholders

452. Special drilling authorisations obtained under Victoria's onshore legislation by holders of certain titles obtained under the OPGGSA (Vic) for operations in areas adjacent to offshore authorisation areas expire at the time the relevant primary authorisations under the OPGGSA (Vic) expire (or are surrendered or cancelled when those are surrendered or cancelled, and so on).[276] The GGGS Act otherwise applies only to current authority holders of special drilling authorisations under the GGGS Act and creates no liabilities for former holders of these titles.

453. Moreover, there is no process for conversion of a petroleum title to a greenhouse gas storage title, nor is there any trailing liability imposed under the GGGS Act.

454. A summary of selected liabilities for the main titleholder categories is provided in the following table.

Liability	Current Titleholder	Former Titleholder	Former Petroleum Titleholder
General directions	✓	x	x
Serious situation directions	✓	x	x
Remedial directions	x	x	x
Remedial trailing liability	x	x	x
Site-closure and post-closure	✓	✓	x

455. It is noted that the equivalent table for the Victorian offshore legislation (after paragraph 437 above) differs from the one here in certain details. In particular, whereas the Victorian offshore legislation provides remedial directions for current and former titleholders (although not for former petroleum titleholders), the Victorian onshore legislation does not provide such directions at all. Also, whereas the Victorian offshore legislation does not create site closure and post-closure liabilities for the former titleholder category, the Victorian onshore legislation in fact does so.

456. The reasons for the differences between the Victorian offshore and onshore regimes are not elucidated in the legislation itself. However, it is likely that two circumstances have contributed to the differences. First, the Victorian onshore legislation (from 2008) predates the State's offshore legislation (enacted in 2010). The main influence on Victoria's offshore legislation was the Commonwealth's own offshore legislation, with which Victoria sought to achieve consistency. There was no such factor affecting the design of Victoria's earlier onshore legislation, as the Commonwealth did not have (and does not have) an onshore counterpart to its offshore legislation. Second, offshore and onshore storage of CO_2 involved overlapping but also significantly different considerations for the State legislature. An example is the plethora of other legal regimes regulating interests in land and in underground resources, in contrast with the more limited (by comparison) regulation of the sea and the (sub-)seabed.

276 GGGS Act, ss 175A-175B.

Post-closure liabilities

SNAPSHOT

Upon completion of the surrender of an injection and monitoring license, the Crown becomes the owner of the greenhouse gas that has been injected into any underground geological formation under that license.

457. The holder of an authority may surrender the authority with the consent of the Minister.[277] The Minister must not consent to the surrender unless satisfied that the holder of the authority has, among other things, complied with all the conditions that apply to the authority and has closed off all wells that were made in the authority area under the authority.[278]

458. Numerous additional and onerous criteria apply where a request is made to surrender an injection and monitoring license.[279] If the Minister consents to its surrender, the license holder must also, before surrendering the license, pay the remaining cost of carrying out long-term monitoring and verification, as detailed in the license holder's approved long-term monitoring and verification plan.[280]

459. The holder of an authority may apply to the Minister for the Minister's consent to the surrender of *part* of the area to which the authority applies. The Minister may give consent conditional on the authority holder's agreement to a variation of the conditions that apply to the area that will be retained under the authority.[281]

460. It is a condition of an injection and monitoring license that the holder of the license must pay an annual instalment of the estimated long-term monitoring and verification costs set out in the approved injection and monitoring plan.[282] As noted above, surrender of the license entails payment of the remaining cost of carrying out the long-term monitoring and verification.

461. The Minister may grant an injection and monitoring license in respect of land for which the holder of another injection and monitoring license has surrendered the right to inject a greenhouse gas substance. The post-injection monitoring and verification activities of the other license holder continue unaffected by the further license.[283]

462. If an authority ceases to apply to any land, the authority holder at the time the authority ceases to apply must remove all equipment brought on to the land under the authority within 60 days after the authority ceases to apply.[284]

277 GGGS Act, ss 168(1).
278 GGGS Act, ss 168(2)(a)-(c).
279 GGGS Act, ss 170-171.
280 GGGS Act, s 174; and s 170(2) for the approved long-term monitoring and verification plan. No part of this cost may be included in the rehabilitation bond: s 219.
281 GGGS Act, s 169(3).
282 GGGS Act, s 112.
283 GGGS Act, s 87.
284 GGGS Act, s 228.

SNAPSHOT

The main liabilities at the completion and post-completion stages are payment of the cost of long-term monitoring and verification, removal of all equipment and infrastructure related to the operations under the authority, sealing off all injection points and carrying out rehabilitation of the site.

463. On completion of injection activities under an injection and monitoring plan, the holder of a greenhouse gas injection and monitoring license must notify the Minister in writing that the injection activities have been completed, remove all infrastructure associated with the injection activities including plugging or closing off any wells, rehabilitate the site where the injection activities took place, and surrender the right to inject a greenhouse gas substance under the license.[285]

464. If an authority is surrendered or cancelled or expires, the Minister may direct the former authority holder to perform one or more of several tasks to the satisfaction of the Minister, including removing from the relevant area all property brought into that area under the authority, closing off all wells made in the relevant area under the authority, providing for the conservation and protection of the resources in the relevant area, or making good any damage to the surface of the land or sub-soil in the relevant area caused by the operations conducted under the authority.[286]

465. When an injection and monitoring license is cancelled or surrendered, the Crown becomes the owner of any greenhouse gas substance that has been injected into an underground geological formation under that license.[287]

466. Before discharging a rehabilitation bond, the Minister must be satisfied that the relevant land has been rehabilitated, that the rehabilitation is likely to be successful and that any other work in respect of which the bond was required has been satisfactorily completed.[288]

467. If the Minister has asked the holder or former holder of the authority to rehabilitate the land and the holder or former holder has failed to do so within a reasonable period after the request, the Minister may do anything necessary to rehabilitate the land if the Minister is not satisfied that the land has been rehabilitated as required, or is satisfied that further rehabilitation of the land is necessary, or is asked to do so by the owner of the land. In such a case, the Minister may recover, as a debt due to the Crown in a court of competent jurisdiction, any amount incurred that cannot be recovered from the rehabilitation bond that applies in respect of the land.[289]

285 GGGS Act, s 92(1).
286 GGGS Act, s 178.
287 GGGS Act, s 16.
288 GGGS Act, s 223.
289 GGGS Act, s 222.

Barriers to transfer

468. For the transfer of an authority, either the holder of the authority or the person to whom the authority is to be transferred must apply to the Minister for approval of the transfer.[290]

469. The Minister may approve the transfer of an authority if, in the Minister's opinion, the transfer will maintain or increase greenhouse gas sequestration operations in the authority's area (however, where a retention lease is concerned (a lease that holds title for non-commercial discoveries for a certain period of time), the Minister may approve the transfer even if that condition is not met).[291]

470. Where an authority is being wholly transferred, the Minister may vary the conditions that apply to it (except conditions that apply to an injection testing plan or an injection and monitoring plan).[292]

471. Where a primary authorisation is transferred, any special drilling authorisation granted on the basis of that primary authorisation is also transferred.[293]

472. The area subject to an exploration permit or the area subject to an injection and monitoring license may be *partially* transferred upon an application made to the Minister.

473. The Minister may transfer that part of the area if, in the Minister's opinion, the transfer will maintain or increase greenhouse gas injection and monitoring operations in the area.[294]

474. A partial transfer is effected by issuance of a separate permit or license to the transferee. This separate permit or license expires when the original permit or license expires.[295]

475. While, as noted above, the Minister may approve the transfer of an authority if, in the Minister's opinion, the transfer will maintain or increase greenhouse gas sequestration operations in the authority area, the Minister must not approve the transfer of an authority that, in the Minister's opinion, is not in the public interest.[296] The Victorian offshore regime, by contrast, does not necessitate consideration of the public interest in the making of such a decision.

SNAPSHOT

While the "public interest" is broadly defined, it is not likely to raise a significant barrier in routine transfer situations considering that the authority would not have been granted in the first place if it were not in the public interest.

476. The public interest is defined in s 3 of the GGGS Act as meaning "a consideration of any of the following — (a) government policy; (b) employment creation; (c) social impacts; (d) the overall environmental benefit for the State of Victoria and Australia in both the short-term and long-term; (e) the overall economic benefit for the State of Victoria, or a part of the State of Victoria, in both the short-term and long-term; or (f) impacts on aesthetic, amenity or cultural values".

290 GGGS Act, s 164.
291 GGGS Act, s 165(1)-(2).
292 GGGS Act, s 161.
293 GGGS Act, s 164A.
294 GGGS Act, s 167(2).
295 GGGS Act, s 167(3)-(4).
296 GGGS Act, s 165.

477. A person applying for the approval of a transfer must apply for the approval in the manner required by the Minister in a form executed by the parties to the proposed transfer and the applicant must submit the following details concerning the person to whom the authority is to be transferred:

a. the relevant technical qualifications of that person and the relevant technical qualifications of its employees;

b. the relevant technical advice available to it;

c. the financial resources available to it;

d. evidence of the ability of the person to whom the authority is to be transferred to comply with the GGGS Act; and

e. any other details required by the Minister to enable the Minister to assess the application.[297]

478. As described in the Commonwealth section, where the transferee is a foreign entity, the transfer may be subject to approval from FIRB. Please see our analysis at paragraph 416.

297 GGGS Act, s 164.

Australia – Queensland

Issue	Comment	Risk
Existence and robustness of CCS regime	Comprehensive onshore regime focusing solely on existing holder of CCS license, however, untested	
Liability split between stakeholders	Liability regime focuses solely on existing license holder	
Post-closure liability	Greenhouse gas stream becomes the property of the State following surrender of a greenhouse gas title	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

479. In Queensland, greenhouse gas storage titles are primarily governed by the following legislation:

    a. *Greenhouse Gas Storage Act 2009* (Qld) (GGS Act) and its associated regulation, the *Greenhouse Gas Storage Regulation 2021* (Qld) (**GGS Regulation**); and

    b. *Mineral and Energy Resources (Common Provisions) Act 2014* (Qld) (**Resources Act**) and its associated regulation, the *Mineral and Energy Resources (Common Provisions) Regulation 2016* (Qld) (**Resources Regulation**),

    (together, the **Queensland Regime**).

480. Similarly to the Commonwealth OPGGSA, the GGS Act generally uses a requirements / directions based liability framework for regulating greenhouse gas storage operations. Under this regime, the responsible Minister is authorised to direct parties to undertake various activities, including in respect of remediation where a serious situation has occurred. However, the main difference between the Queensland Regime and Commonwealth regime is that the GGS Act focuses solely on the current titleholder's liability rather than extending liability to former titleholders (assuming the current titleholder and former titleholder have put in place all arrangements to effect a lawful transfer).

481. Transfer liability applies to the current titleholder throughout the entirety of a greenhouse gas operation. Even after the Minister has approved the surrender of a greenhouse gas storage title, and the title vests in the ownership of the State, the State does not indemnify the titleholder as at the date of surrender for any leakage post-closure of the site.

482. Lastly, all transfer of titles are subject to legislative barriers in that any proposed transferee would need to meet certain financial and technical requirements.

Transfer liabilities

SNAPSHOT

Similarly to the Commonwealth OPGGSA, transfer liabilities under the Queensland Regime are largely driven by requirements / directions based liability. However, it differs in that the Queensland Regime solely focuses on liability against the current titleholder.

483. Similarly to the Commonwealth OPGGSA, transfer liability under the GGS Act largely derives from various directions powers afforded to the relevant Minister, including the following:

a. the Minister may amend the conditions of a greenhouse gas title in certain circumstances, including by imposing new conditions;[298]

b. the Minister may take various noncompliance actions, including amending, reducing the area of, or cancelling greenhouse gas authorities, and imposing penalties;[299]

c. the Minister may issue directions to titleholders to address "serious situations", such as leaks or significant risks of leaks from greenhouse gas storage reservoirs;[300]

d. the Minister has the power to take action to ensure compliance with the GGS Act's requirements if the titleholder fails to comply;[301]

e. the Minister can require titleholders to provide security for their greenhouse gas titles and can demand additional security if necessary;[302] and

f. the Minister can recover costs incurred by the State for remedial actions taken due to non-compliance by a titleholder.[303]

484. However, the main difference between the two regimes is that the GGS Act focuses solely on the current greenhouse gas titleholder and does not extend liability to former titleholders (assuming the current titleholder and former titleholder have put in place all arrangements to effect a lawful transfer).

485. Throughout the lifespan of the greenhouse gas authority, only the current authority holder is liable for the site (including liability for continuous monitoring of the site),[304] up until the surrender of the authority.

486. However, even after the Minister has approved the surrender of the authority, the GGS Act does not contain any provision by which the State indemnifies the authority holder for any leakage post-closure of the site.

298 GGS Act, ss 92A, 173A and 374.
299 GGS Act, ss 379 and 380.
300 GGS Act, ss 364 and 365.
301 GGS Act, s 371.
302 GGS Act, ss 271 and 272.
303 GGS Act, s 362.
304 See, eg, GGS Act, s 254.

Current Titleholders

SNAPSHOT

Upon transfer of a greenhouse gas authority, the titleholder will be liable for the day-to-day activities under the relevant title. They will further be liable for any "serious situations" and eventual post closure liabilities, as well as be subject to the Minister's other general powers.

487. Upon the transfer of title, the current greenhouse gas titleholder will be solely liable for the day-to-day activities under the relevant title.

488. Further, the current titleholder may be liable to undertake various activities relating to the title, pursuant to the State Minister's "serious situations" direction powers as well as the other powers listed above at paragraph 483.

489. Where a serious situation in relation to a greenhouse gas storage operation has occurred (e.g. a leakage of a greenhouse gas substance), the State Minister may direct the current titleholder to stop or suspend greenhouse gas injections into the reservoir or to take any other steps reasonably necessary to remedy the situation.[305] A breach of this direction constitutes an offence, and the breaching party will be liable for a prescribed penalty.[306]

490. It is important to note that the GGS Act does not contemplate who causes the serious situation, only who the current titleholder is. For example, if a greenhouse gas leakage was ultimately caused by a latent defect of the previous titleholder, on a strict interpretation of the legislation, a "serious situations" direction can only be made against the current titleholder.

Former Titleholders

SNAPSHOT

Unlike the Commonwealth OPGGSA, the Queensland Regime does not extend liability to former titleholders.

491. The GGS Act does not extend liability to former titleholders. Once a titleholder has transferred its title to another, it is absolved from all current and future liabilities relating to such title.

492. It should be noted that the GGS Act uses a concept of "former holder" of a greenhouse gas authority. However, the text and context of the provisions in which the expression is used indicates in our view a focus on the entity that held the greenhouse gas title immediately before its surrender to the State (i.e. not the entity that transferred the title to another entity). By way of example, the Minister has certain powers under the GGS Act to authorise the "holder or former holder" of a greenhouse gas title to enter onto the site to rectify non-compliances mainly relating to decommissioning.[307] The terminology is used to capture situations where the site has been decommissioned and handed over to the State.

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305 GGS Act, s 364.
306 GGS Act, s 366.
307 See, eg, GGS Act, ss 268, 335, 356.

Former Petroleum Titleholders

SNAPSHOT

There is no process for the conversion of a petroleum title to a greenhouse gas title unlike the Commonwealth OPGGSA. There is no trailing liability imposed under the GGS Act.

493. Under the GGS Act, there is no process for the conversion of one title (i.e. a petroleum title) to another title (i.e. a greenhouse gas title). An applicant must make an application to the responsible State Minister if they wish to obtain a greenhouse gas authority,[308] even if they currently hold the petroleum title. The implication of this process is that a former petroleum titleholder is not considered a "former titleholder" for the purposes of the relevant greenhouse gas storage operations.

494. Unlike the Commonwealth OPGGSA, there is no trailing liability imposed under the GGS Act.

Comparison

495. For ease of reference, we set out below a comparison of transfer liabilities for: (1) current titleholder; (2) former titleholders; and (3) previous petroleum titleholders, relating to current or future greenhouse gas storage operations.

Liability	Current Titleholder	Former Titleholder	Former Petroleum Titleholder
Serious situation directions	✓	x	x
Other Ministerial directions / powers	✓	x	x
Remedial trailing liability	✓	x	x
Site-closure and post-closure	✓	x	x

Post-closure liabilities

SNAPSHOT

The Queensland Regime sets out a process for surrendering and decommissioning a reservoir that has been injected with greenhouse gas. Although the stored greenhouse gas stream becomes the property of the State following surrender of a greenhouse gas title, the GGS Act does not provide greenhouse gas titleholders with an indemnity for liability post-closure.

496. If greenhouse gas injection has ceased, and the titleholder has decommissioned all wells in the relevant area in accordance with the process set out in s 267 of the GGS Act, the titleholder must make a surrender application to the Minister within 60 business days.

308 See, eg, GGS Act, Chapter 2, Part 2.

497. The surrender application must include information about the following:[309]

a. the types of activities carried out by the titleholder and the results of the activities;

b. modelling / behaviour of the greenhouse gas injected into the reservoir, including expected migration pathways;

c. suggested approach to be taken by the State to monitor and verify the behaviour of the greenhouse gas stream; and

d. further information about the greenhouse gas stream as specified by cl 9 of the GGS Regulation.

498. A surrender can only be granted if the Minister considers that all of the risks associated with the storage have been reduced as much as is reasonably practicable.[310] In deciding whether to approve a surrender the Minister must also consider the extent to which the titleholder has complied with the conditions of the relevant greenhouse gas authority.[311]

499. On surrender of a greenhouse gas authority involving the injection a greenhouse gas stream, the State becomes the owner of the greenhouse gas stream that has been injected into the storage reservoir.[312] Unlike the Commonwealth OPGGSA, there is no specified duration before which the greenhouse gas title may not be surrendered.

500. The GGS Act also provides for the decommission of pipelines, and creates an obligation on the GHG authority to remove any equipment or infrastructure from the land unless the owner of the land otherwise agrees.[313]

501. Although the stored greenhouse gas stream because the property of the State following surrender of a greenhouse gas title, the GGS Act does not provide greenhouse gas titleholders with an indemnity for liability post-closure.

Barriers to transfer

SNAPSHOT

All transfer of titles will be subject to legislative barriers (e.g. financial and technical requirements of transferee).

502. There are various legislative barriers to the transfer of a greenhouse gas authority under the Queensland Regime.

503. The existing titleholder may apply to the State Minister to obtain consent for the transfer of a greenhouse gas authority.[314]

309 GGS Act, s 177.
310 GGS Act, s 179(1)(b).
311 GGS Act, s 179(2).
312 GGS Act, s 181(2).
313 GGS Act, s 252.
314 Resources Act, s 19.

504. The application must comply with the manner and form requirements set out in Chapter 6, Part 1 of the Resources Act.

505. Prior to the grant of consent, the Minister must consider the following:

    a. the application and any additional information accompanying the applications;[315]

    b. the extent to which the transferee is capable of carrying out authorised activities under the greenhouse gas authority, having regard to the transferee's:

        i. financial and technical resources;[316] and

        ii. ability to manage greenhouse gas storage exploration / storage;[317] and

    c. the public interest.[318]

506. Further, approval may only be given for a transfer if the transferee is a registered suitable operator under the *Environmental Protection Act 1994* (Qld).[319] The Minister may also refuse to give approval if the Minister is not satisfied the transferor has substantially complied with the conditions of the greenhouse gas authority.[320]

507. As described in the Commonwealth section, where the transferee is a foreign entity, the transfer may be subject to approval from FIRB. Please see our analysis at paragraph 416.

315 Resources Regulation, cl 10(2)(a).
316 Resources Regulation, cl 10(2)(f); GGS Act, ss 42(1)(c)(i) and 118(1)(i)(i).
317 Resources Regulation, cl 10(2)(f); GGS Act, ss 42(1)(c)(ii) and 118(1) (i)(ii).
318 Resources Regulation, cl 10(2)(h).
319 Resources Regulation, cl 10(4)(b).
320 Resources Regulation, cl 10(5).

Australia – South Australia

Issue	Comment	Risk
Existence and robustness of CCS regime	Comprehensive onshore regime focusing solely on existing holder of CCS license, however, untested	
Liability split between stakeholders	Regime focuses mainly on existing license holder, with liability extended to former holders in clear exceptional circumstances only	
Post-closure liability	Continue remaining liable for rehabilitation directions and costs associated with environmental rehabilitation caused by serious environmental damage	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

508. Liabilities associated with the transfer of greenhouse gas storage titles (called "licenses" in South Australia) under the South Australian regime are primarily governed under the *Energy Resources Act 2000* (SA) (**ERA**) and the *Energy Resources Regulations 2013* (SA) (**ERR**) (collectively, the **SA CCS Legislation**).

509. The SA CCS Legislation governs the onshore greenhouse gas storage. We note that the South Australian offshore regime does not currently contemplate CCS activities.

510. Similarly to the Commonwealth OPGGSA, the SA CCS Legislation generally uses a requirements / directions based liability framework for regulating gas storage operations. Under this regime, the State Minister is authorised to direct gas storage licensees ensure obligations under the ERA or the license are met. There are further powers for the State Minister to direct current licensees to undertake environmental and rehabilitation actions.

511. However, the main difference between the SA CCS Legislation and the OPGGSA is that the SA CCS Legislation largely focuses on current licensee liability rather than extending liability to former licensees. Upon transfer of license, a former licensees is absolved of all liability (assuming the current titleholder and former titleholder have put in place all arrangements to effect a lawful transfer), except for liability where environmental rehabilitation has occurred as a result serious environmental damage.

512. Further, we note that there is no concept of "post-closure". Even after the greenhouse gas storage license is ultimately surrendered / cancelled at the end of the greenhouse gas storage operation, the State does not indemnify the licensee for any liability post surrender / cancellation.

513. There is however, a mechanism to allow a licensee to limit or exclude its liability. This requires the licensee to provide the State Minister with a report detailing an assessment of the risk inherent in regulated activities, and the precautions necessary to eliminate or minimise the risk.

Transfer liabilities

SNAPSHOT

Similar to the Commonwealth OPPGSA, transfer liabilities under the SA CCS Legislation are largely driven by requirements / directions based liability. However, it differs in that the regime mainly focuses on the current licensee, and lacks an equivalent trailing liability regime.

514. Under the SA CCS Legislation, transfer liability largely derives from various directions powers afforded to the SA Minister to direct a person to undertake certain activities.

515. However, unlike the OPGGSA, the SA CCS Legislation mainly focuses on the current licensee, only extending liability to a former licensee for certain causes of action.

516. We set out below transfer liabilities for: (1) current licensees; (2) former licensees; and (3) previous petroleum licensees, relating to current or future greenhouse gas storage operations.

Current Licensees

SNAPSHOT

Upon transfer of a greenhouse gas storage license, the licensee may be liable for general directions to carry out specified obligations under the SA CCS Legislation. Licensees may also be issued environmental directions and remedial directions. They will further be liable for costs environmental rehabilitation caused by "serious environmental damage".

517. Similar to the OPGGSA, the SA CCS Legislation accords the State Minister broad powers to issue general directions to a current greenhouse gas storage licensee. Such directions require the licensee to:[321]

    a. carry out specified obligations under the ERA;

    b. take specified action required to ensure obligations under the ERA or the license are met; or

    c. cease specified activities that are contrary to the ERA or the license,

    with failure to comply with such direction resulting in a financial penalty.[322]

518. There are 2 further specific directions a current licensee will be liable for upon the transfer of license and throughout the lifespan of the greenhouse gas storage operation.

519. The SA Minister may issue an environmental direction where, in the SA Minister's opinion, regulated activities conducted by the licensee are being conducted in a way that results in, or that is reasonable likely to result in:[323]

321 ERA, s 88(1).
322 ERA, s 88(2).
323 ERA, s 108(1).

a. undue damage to the environment;

b. a breach of a statement of environmental objectives; or

c. any other breach of the *Energy Resources Act 2000* (SA),

with failure to comply with such direction resulting in a financial penalty.[324]

520. The SA Minister may issue a rehabilitation direction for the licensee to:[325]

a. rehabilitate land in accordance with the requirements of a statement of environmental objectives;

b. to rehabilitate land to a standard required to secure compliance with a condition of the relevant license; and

c. to remove decommissioned equipment and facilities,

with failure to comply with such direction resulting in a financial penalty.[326]

521. A licensee is also liable to compensate the State for the cost of environmental rehabilitation the State is reasonably required to carry out as a result of serious environmental damage, or a threat or potential of serious environmental damage, arising from activities carried out under the license.[327]

Former Licensees

SNAPSHOT

The SA CCS Legislation only extends liability to former licensees for environmental rehabilitation as a result of serious environmental damage, or a threat of serious environmental damage.

522. A former licensee is also liable to compensate the SA State for the costs of environmental rehabilitation the State is reasonably required to carry out as a result of serious environmental damage, or a threat or potential of serious environmental damage, arising from activities carried out under the license.[328]

523. However, we note that there is no delineation of this liability between former and current licensee, and the SA CCS Legislation does not provide guidance as to when the former licensee will be liable for such compensation over the current licensee.

524. Neither the environmental directions (paragraph 519) or remedial directions (paragraph 520) apply to a former licensee. It should be noted however that the SA CCS Legislation does reference that a former licensee required to comply with a direction may apply for a review of such direction.[329] However, the text and context of the directions provisions and "review" provision indicates in our view that "former licensee" is referring to the licensee who last held the license immediately before its expiration, cancellation or surrender (i.e. not the entity that transferred the license to another entity).[330]

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324 ERA, s 108(4).
325 ERA, s 109(1).
326 ERA, s 109(3).
327 ERA, s 111.
328 ERA, s 111.
329 ERA, s 110(1).
330 See, eg, ERA, s 109(4).

Former Petroleum Licensee

SNAPSHOT

There is no process for the conversion of petroleum license to a greenhouse gas storage license. Further, unlike the Commonwealth OPGGSA, the SA CCS Legislation does not include a trailing liability regime that could extend liability to a former petroleum licensee.

525. Under the SA CCS Legislation, there is no process for the conversion of one license (i.e. a petroleum production license) to another license (i.e. a greenhouse gas storage license). An applicant must make an application to the responsible State Minister if they wish to obtain a greenhouse gas storage license, even if they currently hold the petroleum license.[331] The implication of this process is that a former petroleum licensee is not considered a "former licensee" for the purposes of the relevant greenhouse gas storage operations.

526. Unlike the Commonwealth OPGGSA, there is no trailing liability imposed under the SA CCS Legislation.

Comparison

527. For ease of reference, we set out below a comparison of transfer liabilities for: (1) current licensees; (2) former licensees; and (3) previous petroleum licensees, relating to current or future greenhouse gas storage operations.

Liability	Current Titleholder	Former Titleholder	Former Petroleum Titleholder
General directions	✓	x	x
Environmental directions	✓	x	x
Rehabilitation directions	✓	x	x
Costs for serious environmental damage	✓	✓	x

Post-closure liabilities

SNAPSHOT

The SA CCS Legislation sets out a process for surrendering a greenhouse gas storage license, however does not provide the licensee with an indemnity for liability post-surrender. The holder of license immediately before the license's surrender will continue remaining liable for rehabilitation directions and costs associated with environmental rehabilitation caused by serious environmental damage.

331 See, eg, ERA, s 35.

528. The SA CCS Legislation does not contemplate "post-closure". Instead, once the greenhouse gas storage operations have ceased, the licensee can apply to have the greenhouse gas storage license surrendered.[332]

529. Even after surrendering the license, the licensee may still be liable for rehabilitation directions (as it applies to the holder of license immediately before the license's surrender).[333] The licensee will also continue being liable for costs of environmental rehabilitation as a result of serious environmental damage arising from activities carried out under the license.[334] However, a licensee can apply to limit or exclude such liability by providing the State Minister with an independent expert made report detailing an assessment of the risk inherent in regulated activities, and the precautions necessary to eliminate or minimise the risk.

530. Finally, the SA CCS Legislation does not contemplate a mechanism to require the State Government to indemnify the licensee for any liability post surrender of license.

Barriers to transfer

SNAPSHOT

All transfer of licenses will be subject to legislative barriers (e.g. financial and technical requirements of transferee). There are further barriers depending on the type of greenhouse gas storage license being transferred.

531. There are various legislative and non-legislative barriers to transfer of a greenhouse gas title under the SA CCS Legislation.

Legislative Barriers

532. Under the SA CCS Legislation, different barriers to transferring a greenhouse gas license are required depending on the type of license being obtained. For all licenses, an application must be accompanied by a statement of the financial and technical resources available to the applicant.[335]

533. For a greenhouse gas storage exploration license, an application must include:[336]

    a. the proposed work program and information as to the approximate cost of operations to be carried out under the program in each year of the license; and

    b. a technical report that assesses the prospectivity of the area and how the proposed work program relates to this prospectivity.

534. For a greenhouse gas storage retention lease, an application must include:[337]

    a. the proposed work program and information as to the approximate cost of operations to be carried out under the program in each year of the license;

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332 ERA, s 89.
333 ERA, s 109(4).
334 ERA, s 111.
335 ERA, s 65(1)(c).
336 ERR, r 6.
337 ERR, r 7.

b. in the case of an application for a proposed retention lease, all information reasonably required to enable to SA Minister to assess whether:

   i. the grant of license is reasonable to facilitate the testing of the relevant natural reservoir for the storage of a regulated substance; or

   ii. the grant of the license may proceed because the use of the relevant natural reservoir for the storage of a regulated substance is not currently commercially feasible;

c. in the case of an application for an existing retention lease, all information reasonably required for the SA Minister to assess whether the natural reservoir is likely than not to be used in connection with the production of a regulated substance within the next 15 years, including assessment of the factors and risk that may influence predicted outcomes; and

d. a map showing the outline of the proposed area for the proposes of the Act.

535. For a greenhouse gas storage license, an application must include:[338]

a. a map showing the outline of the proposed area for the proposes of the Act; and

b. information on the day on which operations would commence under the license and the anticipated monthly injection for the first 12 months following commencement of operations.

536. It is worth noting that there is a requirement for a licensee to prepare an environmental impact report detailing the licensee's regulated activities. However, unlike the OPGGSA, it appears that a new environmental impact report is not required where a license is transferred to a new holder.

537. As described in the Commonwealth section, where the transferee is a foreign entity, the transfer may be subject to approval from FIRB. Please see our analysis at paragraph 416.

338 ERR, r 8.

Australia – Western Australia

Issue	Comment	Risk
Existence and robustness of CCS regime	Liability regime yet to be in force, however heavily mimics the Australian Commonwealth regime	
Liability split between stakeholders	Liability regime solely focuses on existing CCS license holder, however, broad directions powers may extend liability to former proponents	
Post-closure liability	Minimum period of 15 years post obtaining a site closing certificate	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

538. Western Australia's greenhouse gas regime is being introduced under the *Petroleum Legislation Amendment Act 2024* (WA) (**PLAA**). This amending act amends:

    a. the *Petroleum and Geothermal Energy Resources Act 1967* (WA) (**PGERA**) and *Petroleum Pipelines Act 1969* (WA) (**PPA**) in relation to greenhouse gas storage operations within WA's onshore area; and

    b. the *Petroleum (Submerged Lands) Act 1982* (WA) (**PSLA**) in relation to greenhouse gas storage operations within WA's offshore areas (3 nautical miles from WA's shores),

    (collectively, the **WA CCS Legislation**).

539. The WA CCS Legislation largely mimics the OPGGSA in that transfer liabilities will largely derive from a directions based liability framework. However, the main difference between the WA and Commonwealth regime is that the WA CCS Legislation focuses solely on the current titleholder's liability rather than extending liability to former titleholders.

540. Under the WA CCS Legislation, current titleholders will be liable to various transfer liabilities, pursuant to the State Minister's power to issue directions. These directions include general directions relating to broad greenhouse gas matters, directions where a serious situation has occurred, and eventual site-closure directions and post-closure directions.

541. Transfer liability applies throughout the entirety of a greenhouse gas storage operation, until a minimum of 15 years after the storage operations have ceased. At this point in time, the State government may indemnify titleholders for certain liabilities relating to the operations.

542. Similar to the OPGGSA, the WA CCS Legislation does not contemplate the delineation of liability between former and current titleholders.

543. Lastly, there are potential commercial and transactional barriers to transferring a greenhouse gas title. These range from legislative barriers, such as prescribed criteria for the transferee, and practical barriers that may arise in respect of each transaction subject to the project strategy and surrounding facilities and assets.

Transfer liabilities

SNAPSHOT

Mimicking the OPGGSA, transfer liabilities under the WA Legislation are largely driven by directions-based liability. However, it differs in that the WA Legislation solely focuses on liability against the current titleholder.

544. Similar to the Commonwealth OPGGSA, transfer liability under the WA Legislation largely derives from the various directions powers afforded to the WA Minister to direct a person to undertake certain activities.

545. However, the main difference between the two regimes is that the WA Legislation focuses solely on the current greenhouse titleholder and does not extend liability to former titleholders.

546. We set out below transfer liabilities for: (1) current titleholders; (2) former titleholders; and (3) previous petroleum titleholders, relating to the current or future greenhouse gas storage operations.

Current Titleholders

SNAPSHOT

Upon transfer of a greenhouse gas title, the titleholder will be liable for the day-to-day activities under the relevant title. They will further be liable for any "serious situations" and eventual post closure liabilities, as well as broad general directions.

547. Upon the transfer of title, the current greenhouse gas titleholder will be solely liable for the day-to-day activities under the relevant title.

548. Further, the current titleholder may be liable to undertake various activities relating to the title, pursuant to the State Minister's "serious situations" directions powers and general directions powers.[339]

549. Where a serious situation in relation to a greenhouse gas storage operation has occurred (e.g. leakage of a greenhouse gas substance), the State Minister may direct the current titleholder to undertake activities for the purpose of eliminating, mitigating, managing, or remediating the serious situation. A breach of this direction constitutes an offence, and the breaching party will be liable for a prescribed penalty.[340]

550. It is important to note that that WA Legislation does not contemplate who causes the serious situation, only who the current titleholder is. For example, if a greenhouse gas leakage was ultimately caused by a latent defect of the previous titleholder, on a strict interpretation of the legislation, a "serious situations" direction can only be made against the current titleholder.

551. The WA Legislation also mimics the OPGGSA general directions powers. Throughout the lifespan of the greenhouse gas storage operations, the State Minister has broad discretionary powers to issue general

339 PLAA inserting ss 69HB PGERA, 74AJ PSLA.
340 PLAA inserting ss 69HD PGERA, 74AL PSLA.

directions to current titleholders. What the directions may relate to mimics the activities as set out in paragraph 397. A breach of such direction constitutes an offence liable for a prescribed penalty.

Former Titleholders

SNAPSHOT

Unlike the OPGGSA, the WA Legislation does not extend liability to former titleholders. However, former titleholders may be liable to the broad general directions.

552. The WA Legislation does not extend liability to former titleholders. Once a titleholder has transferred its title to another, it is absolved from all current and future liabilities relating to such title.

553. However, as the WA Legislation mimics the OPGGSA general directions powers, the State Minister has the broad discretion to issue general directions against any person who is in the offshore area or within the vicinity of the greenhouse gas storage operation (see paragraph 406).

554. As such, former titleholders should be aware that they may still be liable under the broad general directions powers as long as they are within the vicinity of the greenhouse gas storage operation.

Former Petroleum Titleholders

SNAPSHOT

Former petroleum titleholders "surrender" its title to the State rather than "transferring" it to future greenhouse gas titleholders. This process absolves the titleholder of all future liabilities. However, former petroleum titleholders may be subject to liability under the broad directions powers.

555. Mimicking the OPGGSA, the WA Legislation does not include a process for the conversion of one title (i.e. a petroleum title) to another title (i.e. a greenhouse gas title). An applicant must make an application to the State Minister if they wish to obtain a greenhouse gas title, even if they currently hold a petroleum title for the same offshore area.[341] The implication of this process is that the former petroleum titleholder does not "transfer" its title to the new greenhouse gas titleholder. It instead "surrenders" the title to the State, which absolves the titleholder of all future liabilities.

556. Please see the analysis set out in paragraphs 552 –.554, which equally applies to former petroleum titleholders.

557. We note that the WA Legislation does not include a trailing liability regime.

341 PLAA amending s 40A PSLA.

Comparison

558. For ease of reference, we set out below a comparison of transfer liabilities for: (1) current titleholders; (2) former titleholders; and (3) previous petroleum titleholders, relating to current or future greenhouse gas storage operations.

Liability	Current Titleholder	Former Titleholder	Former Petroleum Titleholder
General directions	✓	?	?
Serious situation directions	✓	x	x
Remedial directions	N/A	N/A	N/A
Remedial trailing liability	N/A	N/A	N/A
Site-closure and post-closure	✓	x	x

Post-closure liabilities

SNAPSHOT

The State may indemnify the greenhouse gas titleholder after a minimum period of 15 years post obtaining a site closing certificate (obtained once all operations of injection have ceased).

559. The WA Legislation largely mimics the approach under the Commonwealth OPGGSA.

560. A WA greenhouse gas titleholder must apply for a site closing certificate within 30 days (or longer, at the discretion of the Minister) after the site's injection operations have ceased, with failure to do so resulting in a penalty against the titleholder.[342] The application must be accompanied by the following documents:[343]

a. a written report detailing the titleholder's modelling and behaviour of the greenhouse gas substance, any information (and analysis) relevant to that modelling;

b. a written report setting out the behaviour of the greenhouse gas substance, its expected migration pathways and short term / long term consequences; and

c. the titleholder's suggestion for approach to be taken by the State after issuance of a site closing certificate.

561. The Minister must then decide whether to issue a pre-certificate notice to the titleholder.[344] The Minister is afforded broad discretion to issue or refuse the notice.[345] The pre-certificate notice must contain a program of operations proposed by the State for the purposes of monitoring the behaviour of the greenhouse gas

342 PLAA inserting ss 69HF PGERA, 74AN PSLA.
343 PLAA inserting ss 69HI PGERA, 74AQ PSLA.
344 PLAA inserting ss 69HL PGERA, 74AT PSLA.
345 PLAA inserting ss 69HM PGERA, 74AU PSLA.

substance. It must also include an estimate for the total costs of carrying out such program, to be paid in the form of a security. In order for the titleholder to obtain the site closing certificate, it must lodge the security within 2 months after the pre-certificate notice was given to the titleholder.[346]

562. Upon obtaining the site closing certificate, the titleholder will remain liable for the monitoring and maintenance of the injection site for a minimum of 15 years.[347] After 15 years have lapsed, the Minister may declare a closure assurance period, after which the State will indemnify the titleholder against the following:[348]

a. liability for damages;

b. liability attributable to an act done or omitted to be done in the carrying out of operations authorised by the license in relation to the formation;

c. liability incurred or accrued after the end of the closure assurance period in relation to the formation; and

d. such other conditions as are specified in the regulations.

563. A closure assurance period may only be declared if the Minister is satisfied that there the greenhouse gas substance is behaving as predicted and that there will be no significant risk that the injected greenhouse gas will have a significant adverse impact on the geotechnical integrity of the geological structure, the environment, or human health or safety.[349]

346 PLAA inserting ss 69HO PGERA, 74AW PSLA.
347 PLAA inserting ss 69HW PGERA, 74AZE PSLA.
348 PLAA inserting ss 69HX PGERA, 74AZF PSLA.
349 PLAA inserting ss 69HW(1)(c) PGERA, 74AZE(1)(c) PSLA.

Barriers to transfer

SNAPSHOT

All transfers of title will be subject to legislative and non-legislative barriers (e.g. financial and technical requirements of transfer). While there are currently no proposed amendments to the WA Legislation regulations, we assume that there will be future barriers to transfer relating to change in operational control of a greenhouse gas injection site (similar to the approach under the OPGGSA).

564. There are various legislative and non-legislative barriers to transfer of a greenhouse gas title under the WA Legislation.

Legislative Barriers

565. Under the WA Legislation, any transfer of title is of no force until it has been approved by the State Minister. An application for approval of transfer must be accompanied by an instrument of transfer and an instrument setting out:[350]

    a. the technical qualifications of the transferee;

    b. details of the technical advice that is or will be available to the transferee; and

    c. details of the financial resources that will be available to the transferee.

566. We note that the WA government are still in the process of amending the existing WA Legislation regulations. As such, the WA regime does not currently include similar barriers to transfer relating to change in titleholder with operational control of the greenhouse gas injection site that are found in the Commonwealth regime. However, given the similarities between the WA and Commonwealth regimes, we assume transfer requirements such as a new safety case, well operations management plan and environmental plan will be required in the future.

567. As described in the Commonwealth section, where the transferee is a foreign entity, the transfer may be subject to approval from FIRB. Please see our analysis at paragraph 416.

350 PLAA amending ss 72(3) PGERA, 44(3) PPA, 78(3) PSLA.

Italy

Issue	Comment	Risk
Existence and robustness of CCS regime	CCS framework does not establish liability regime in relation to transfer of CCS license. Liabilities captured under broad Environmental Code	
Liability split between stakeholders	"Polluter-pays" principle delineates liability between proponents, requiring causal link between the conduct of a proponent to the pollution found. Regime does not clearly delineate liability between various proponents	
Post-closure liability	Minimum period of 20 years post site closing	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

568. Liabilities for the transfer of greenhouse gas storage authorisation ("**GGS authorisation**") under the Italian law is governed by:

    a. Legislative Decree No. 162/2011 (*GGS Decree*) implementing EU Directive No. 2009/31/CE and subsequent amendments, concerning the storage of greenhouse gas;

    b. Legislative Decree No. 152/2006 (*Italian Environmental Code*) in relation to the obligations and liabilities arising in the case of a pollution event occurs;[351]

    c. the settled Italian administrative case law at both first and second instance concerning environmental liability for pollution event; and

    d. the European principle "polluter pays" which has been implemented in the Italian Environmental Code and has been applied as an interpretative tool by the Italian administrative case law.

569. In particular, the GGS Decree does not establish a specific liability framework in case of a transfer of the GGS authorisation between the previous greenhouse gas storage titleholder (**GGS titleholder**) and the incoming GGS titleholder. Indeed, in the case of a transfer of the GGS authorisation to another entity (for example, through demerger, merger, or transfer of a going concern) and thus during the operational life of the project, the GGS decree only establishes the modalities and conditions under which such a transfer is subject (see paragraph 598).

570. Therefore, some gaps not regulated by the GGS Decree are covered by the provisions of the Italian Environmental Code as well as by administrative case law, influenced by European decisions (especially in the case of identifying the responsible party for a pollution event following a transfer of the authorisation, in order to establish environmental liability).

351 In general terms, if a company carries out activities with an environmental impact in Italy, these activities may be subject to environmental authorisations. In addition, depending on its activities, the company may be subject to directly applicable environmental provisions and restrictions. Such environmental provisions, are included in Italian Environmental Code.

571. On the other hand, the GGS Decree specifically establishes the modalities and conditions (including general activities relating to broad greenhouse gas matters, remedial activities where a serious situation has occurred, remedial directions for the remediation and decommissioning of a GGS operation, and the eventual site-closure / post-closure activities) for the transfer of liabilities to the public authority once the GGS site is closed.

572. In this respect, transfer liability applies throughout the entirety of a GGS operation, until 20 years after the storage operations have ceased (unless the public authority determines that the greenhouse gas has been effectively, permanently confined to the site).

573. Lastly, there are potential commercial and transaction barriers to transferring a GGS authorisation. These range from legislative barriers, such as prescribed criteria for the transferee, and it may be also required Italian government approval where the transferee is a foreign entity.

Current GGS titleholder obligations and liability

SNAPSHOT

The current GGS titleholder is liable for the day-to-day activities under the relevant license and subsequent decommissioning obligations. In addition, the GGS Decree specifies the conditions / requirements that an operator must comply with in order to obtain the GGS authorisation.

574. The current GGS titleholder bears primary responsibility for all operational and environmental risks associated with the field or site. This includes – inter alia:

a. safe operation and maintenance of infrastructure, and installations (taking into account the location constraints, the construction and operation of the CO_2 storage site does not cause harm to public welfare or to overriding private interests);

b. monitoring activities regarding the CO_2 injection flow (the long-term safety of the CO_2 storage site shall be guaranteed and appropriate measures must be put in place to prevent harm to public assets);

c. compliance with technical standards, environmental legislation, and contractual obligations; and

d. decommissioning obligations.

575. As a general remark, it should be noted that the management, monitoring, and closure of a GGS site is subject to a specific authorization issued – based on the opinion of the CCS Committee – by the Ministry of Economic Development in agreement with the Ministry of the Environment and Energy Safety, through a single procedure which includes the opinions of all relevant authorities, the outcome of the environmental impact assessment procedure, and the agreement with the relevant interested Region.

576. The GGS operator, in order to obtain the GGS authorisation shall demonstrate that they meet general eligibility requirements and they possess the technical, organizational, and financial capacities required to carry out the activities, as specified in Annex III of the GGS Decree, which includes – inter alia:

a. with reference to the general eligibility requirements:

i. If the applicant is established in Italy, a valid certificate issued by the Chamber of Commerce, containing the anti-mafia certification and confirming the absence, within the past five years, of any insolvency proceedings of any kind, including bankruptcy, compulsory administrative liquidation, or admission to composition with creditors. In the case of a group of undertakings (temporary grouping of companies – RTI – or consortium), the above-mentioned certificate must be submitted by each member of the association;

ii. If the applicant is established in another Member State of the European Union or in a third country, a certificate equivalent to the one aforementioned described.. If no such certificate or document is issued by the relevant foreign authority, sufficient proof shall be deemed to be an affidavit or, in countries where such affidavit does not exist, a declaration made by the concerned party before a competent judicial or administrative authority, a notary public, or a qualified professional body of the country in which the legal entity or company has its registered office;

iii. the operator's corporate purpose must include activities relating to mining, or the generation and transportation of electrical and thermal energy, or the transportation of fluids;

iv. a certified copy of the bylaw and the deed of incorporation, in the Italian language; documents submitted in the official language of the applicant's country may be accepted only if accompanied by a certified translation into Italian, conforming to the original text;

b. with reference to the technical, organizational, and financial capacities:

i. the operator shall submit copies of the duly approved financial statements for the last three fiscal years (or, in the case of operator established for less than three years, from the date of incorporation), including the reports of the administrative body and of the board of auditors or statutory auditors concerning the management of the operator;

ii. the operator shall submit a summary statement including the following financial items and indicators: revenue from sales, net income, ROI (return on investment), ROE (return on equity), EBITDA (earnings before interest, taxes, depreciation and amortization), and Leverage (debt-to-equity ratio). As an alternative to these financial indicators, the applicant may submit a credit rating issued by a recognized credit rating agency;

iii. the operator shall submit a self-declaration in lieu of affidavit stating the total and specific turnover for the past three years;

iv. the operator shall submit a report describing its main activities in the field of mining, or in the generation and transportation of electrical and thermal energy, or in the transportation of fluids, carried out in Italy or abroad. In the case of a newly established operator, information regarding the parent company or the corporate group to which it belongs may be submitted in support;

v. the operator shall submit a statement concerning the organizational structure and resources employed in the aforesaid activities;

vi. in addition to the documentation referred to in the preceding paragraphs, companies may submit any other document they consider suitable to demonstrate compliance with the requirements (for example, information relating to parent, subsidiary, or affiliated companies, and, more generally, to the corporate group to which the applicant belongs); and

vii. authorisation cannot be granted to the operator whose fully paid-up share capital is less than Euro 10 million. In addition please consider that the operator must provide a financial guarantee in order to ensure compliance with all obligations arising from the authorisation, including the requirements for the closure and post-closure phases.

In addition to the above documentation the operator may submit any other document they consider suitable to demonstrate compliance with the requirements.

Please note that in case of transfer, all the provision of the GGS Decree applies to the incoming GGS titleholder, thus the latter shall meet general eligibility requirements and shall possess the technical, organizational, and financial capacities.

Former operator obligations and liability

SNAPSHOT

Post-transfer, a former operator is released from all future operational responsibilities. However, liability may persist for former operators under Italian environmental laws.

577. In general, once a transfer is approved by the Ministry of the Environment and Security Energy (in consultation with the interested Region), the former operator is released from future operational responsibilities.

578. However, Italian environmental law (in line with European principles and case laws) allows for liability for past actions to persist, especially in cases of environmental damage / pollution.

579. This means that a former operator may still be held accountable for remediation or damages if it is proven that such issues originated during their period of activity, even after the asset or authorisation has been transferred.

Transfer liabilities

SNAPSHOT

Transfer liability under Italian law and administrative case law entail that certain environmental activities may be ordered to be carried out by the current GGS titleholder and / or the former GGS titleholder, throughout the various stages of the GGS operation.

580. A transfer of GGS authorisation will not absolve the former GGS titleholder from all liability under the relevant authorisation. The Italian law and the settled administrative case law ensure that current and former GGS titleholders may be liable to undertake various activities, including securing measures restoration and remedial work in case of breaches of environmental provisions.

581. As already highlighted above, the GGS Decree does not specify a liability framework in the case of transfer of GGS authorisation from the former GGS titleholder to the current GGS titleholder, as it only indicates the condition and modalities to which such transfer is subject (see paragraph 598).

582. Therefore, the provisions regarding environmental liabilities are generally governed by the Italian Environmental Code and are further developed by the orientations of Italian administrative case law, under the influence of European principles and directives.

583. As a general remark, the Italian Environmental Code defines "environmental damage" as any significant and measurable deterioration, direct or indirect, of a natural resource or of the utility provided by the latter".[352]

584. In the event of environmental damage, the "operator" who has caused the damage shall without delay communicate all relevant aspects of the situation to the competent authorities as well as immediately take all practicable initiatives to control, contain, eliminate or otherwise manage, with immediate effect, any damage factor, in order to prevent or limit further environmental damage and harmful effects on human health or further deterioration of services, also on the basis of the instructions issued by the competent authorities. In the event of inertia in the environmental restoration activities by the operator who has caused the damage, or where the responsible party cannot be identified or is not required to bear the costs, the Minister of Environment and Energy Security can directly adopt such measures and then claim compensation from the person who has caused or contributed to causing the damage, if they are identified within the following 5 years.

585. It is worth noting that the concept of "operator", under the Italian Environmental Code,[353] has been extensively debated in Italian administrative case law concerning environmental liability, taking into account the implications of the case law of the European Court of Justice on the "substantive conception of the company" and the "polluter-pays" principle set forth in Article 191, paragraph 2, of the Treaty on the Functioning of the European Union (**TFEU**).

352 This is not the only definition of environmental damage contained in the Italian Environmental Code, as the latter, takes up the definition of environmental damage contained in EU Directive 2004/35/EC, providing that environmental damage constitutes the deterioration, in comparison with the original conditions, caused: (a) to species and natural habitats protected by national and Community legislation, as well as to wild flora and fauna, and to protected natural areas; (b) to inland waters, through actions that significantly negatively affect (1) the ecological, chemical or quantitative status or ecological potential of the waters concerned, or; (2) the environmental status of the marine waters concerned; (c) coastal waters and waters included in the territorial sea by means of the above-mentioned actions, even if carried out in international waters; (d) to land, by any contamination that creates a significant risk of harmful effects, including indirect effects, on human health as a result of the introduction into the soil, ground or subsoil of substances, preparations, organisms or micro-organisms harmful to the environment.

353 For operator, it means *"any person, whether natural or legal, public or private, who carries out or controls a professional activity with environmental relevance, or anyone who exercises decision-making power over the technical and financial aspects of such activity, including the holder of the permit or authorisation to carry out said activity".*

Polluter-pays principle

SNAPSHOT

"Polluter-pays" principle delineates liability to ensure liability falls on the actual polluter by requiring a causal link to be established between the conduct of a CCS proponent and the pollution.

586. This principle consists of charging the real polluter with the costs of preventing, reducing or eliminating the pollution produced. It is the mainstay of Directive 2004/35/EU on environmental liability with regard to the prevention and remedying of environmental damage, as well as of Directive 2008/98/EU on waste, and is explicitly referred to among the general principles of the Italian Environmental Code.

587. Under the polluter-pays principle, an indispensable condition for the attribution of environmental liability to a subject is the existence of a causal link between the conduct of the entity and the pollution found.

588. The Court of Justice of the European Union, in interpreting the polluter-pays principle, has clarified that for the purposes of identifying the person responsible for the pollution, *"the competent authority must have plausible evidence capable of supporting its presumption, such as the proximity of the operator's installation to the pollution found and the correspondence between the pollutants found and the components used by that operator in the course of his business. When it has such evidence, the competent authority is then in a position to prove a causal link between the operators' activities and the diffuse pollution found"* (Court of Justice of the EU, 4 March 2015, Case C534/2013).

589. The ascertainment of the link between a given alleged cause of pollution and its effects is based on the criterion of "more likely than not" (i.e. it requires that the etiological link hypothesized by the competent authority is more likely than not) and the competent authority, for the purposes of identifying the responsible party for the pollution, may also resort to simple presumptions.

590. The polluter-pays principle ultimately entails that:

a. the party responsible for the pollution, also by order of the competent authorities, must implement all the measures, restorative and/or compensatory, necessary to eliminate or reduce the pollution found and bear the related costs; and

b. such measures and the related costs cannot and must not be imposed on any person who, in light of the circumstances of the specific case, is not responsible for the pollution.

Post-closure liabilities

SNAPSHOT

The public authorities will indemnify the GGS titleholder after a minimum period of 20 years post site closing (i.e. once all prescriptions provided for by the GGS authorisation have been duly fulfilled with), or before, if all available evidence indicates that the stored greenhouse gas will be completely and permanently confined.

591. The activities of closing a GGS site are subject to authorisation by the Ministry of Enterprise and Made in Italy in agreement with the Ministry of the Environment and Security Energy and in consultation with the interested Region.

592. A GGS site is closed:

a. if the conditions indicated in the authorisation regarding the closure are met;

b. upon a justified request by the GGS titleholder; and

c. following the revocation of the GGS authorisation in case of breach of the provisions under the GGS Decree.

593. Should the closing of the storage site occur due to the revocation of the GGS authorisation (paragraph c above), the Ministry of Enterprise and Made in Italy will be responsible for monitoring and corrective measures, as well as all obligations related to the return of emission allowances in case of leaks pursuant to legislative decree No. 47/2020 and the prevention and repair actions, if needed, pursuant to the **Italian Environmental Code**. However, the costs for carrying out such activities are borne by the GGS titleholder, who covers them with the resources of the financial guarantee (which it must provide in order to obtain the relevant GGS authorisation) and, for any excess part, using the titleholder's own economic resources.

594. Should the closing of the storage suite occur due to paragraphs a and b above, the current GGS titleholder continues to be responsible for monitoring, reporting, and corrective obligations, as well as all obligations related to the return of emission allowances in case of leaks pursuant to legislative decree No. 47/2020, and the prevention and repair actions, if needed, pursuant the Italian Environmental Code until the transfer of liabilities to the Ministry of Enterprise and Made in Italy occurs. In this regard, transfer of liabilities occurs only once the following conditions are met:[354]

a. all available evidence indicates that the stored greenhouse gas will be completely and permanently confined;

b. a period of no less than 20 years from the closing of the site has elapsed , unless the criterion referred to in subparagraph a above is met before the end of this period;

354 In addition, before the transfer occurs, the GGS titleholder shall submits a detailed final report to the Ministry of Enterprise and Made in Italy, the Ministry of the Environment and Security Energy, and the interested Region evidencing: (i) the conformity between the actual behaviour of the injected greenhouse gas and the behaviour derived from the models; (ii) the structural integrity of the closure system; (iii) the absence of significant irregularities or detectable leaks; (iv) the existence of all conditions that can ensure the long-term future stability of the GGS site.

c. the GGS titleholder has paid the financial contributions due to the public authority for the transfer of post-closing liabilities; and

d. the site has been sealed and the injection facilities dismantled.

595. Once it is ascertained that the above conditions have been duly met, the Ministry of Enterprise and Made in Italy, having heard the Ministry of the Environment and Security Energy, prepares a draft decree authorising the transfer of liabilities to the same Ministry of Enterprise and Made in Italy. The draft specifies the method used to determine that all the conditions that can ensure the long-term future stability of the GGS site have been meet, as well as any updated requirements for the sealing of the storage site and the dismantling of the injection facilities. Such draft will be consequently transmitted to the European Commission for the purpose of obtaining the required non-binding opinion.

596. In the event of fault by the GGS titleholder, including cases of incomplete data, concealment of useful information, negligence, fraud, or failure to exercise due diligence, the Ministry of Enterprise and Made in Italy carries out the restoration actions using the financial contributions paid by the titleholder. However, following the transfer of liabilities to the public authority, further cost recovery towards the GGS titleholder is no longer possible.

Barriers to transfer

SNAPSHOT
All transfer of GGS authorisations are subject to legislative barrier (e.g. financial and technical requirements of transferee, regulatory approval).
In addition, in case of transfer of a GGS authorisation, a specific approval by the Italian Government may be requested.

597. There is a legislative barrier under the GGS Decree to the transfer of a GGS authorisation, including through corporate events such as demerger, merger, or transfer of going concerns.

Legislative Barrier

598. Under the GGS Decree, the GGS authorisation cannot be transferred without the prior approval by Ministry of Enterprise and Made in Italy in agreement with the Ministry of Environment and Security Energy, after consulting the territorially relevant Region. In deciding whether to approve a transfer, the public authorities mentioned above must verify compliance with the following conditions:

a. the transferee is financially sound, reliable, possesses the necessary technical expertise for the management and control of the storage site, and technical and professional training and development programs are provided for both the transferee and all its personnel;

b. the transferee must respect all the provisions established by the GGS Decree with reference to authorisation aspects (this is a very broad prescriptions). By way of example the following conditions must be respected by the transferee:

i. the transferee must comply with all the prescriptions provided for by the original GGS authorisation;

ii. the transferee must guarantee long-term safety of the GGS site;

iii. negative effects on existing mining concessions or mineral deposits must be excluded;

iv. measures must be in place to prevent damage to public assets; and

v. the transferee is not allowed to use the GGS site for purposes that could compromise the site's suitability for greenhouse gas storage.

599. In addition, where the transferee is a foreign entity, the transfer may also be subject to approval of the Italian Government according to law-decree No. 21/2012 and the related implementing regulation (**Golden Power Regulation**). Indeed, the Italian Government has the power to impose conditions or even veto or oppose transactions involving companies engaged in strategic activities or holding strategic assets for national interest if it deems there to be a risk or threat of serious harm to the essential national interests.

600. In this respect, in the sectors of energy, transport, and communications, as well as especially those introduced by EU Regulation No. 452 of 2019, the nationality of the entity acquiring the assets or strategic relationships, particularly whether or not it belongs to the European Union, may sometimes represent a requirement for the exercise of such special powers.

601. Transactions subject to Golden Power Regulation may include changes of control, mergers, demergers, transfers of going concerns, the transfer and establishment of encumbrances on strategic assets, the transfer of company shares, etc.

602. The Golden Powers Regulation include the obligation for companies involved in the transaction to notify the Government in advance of the transactions they intend to carry out and may result in high financial penalties and the nullity of transactional acts if this notification obligation is not complied with.

Korea

Issue	Comment	Risk
Existence and robustness of CCS regime	Nascent and untested legislative framework, with various legislative gaps under review and development	
Liability split between stakeholders	"Polluters pay principle" delineates liability between proponents, with the proponent who caused the liability ultimately responsible. No delineation of liability between current and former CCS proponents in relation to corrective orders	
Post-closure liability	Period of 15 years after closure	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

603. Korea's legislative framework on CCS is still in its early stages, and therefore does not address many scenarios dealt with in the frameworks of more developed jurisdictions. The relevant statute, the Act on the Capture, Transport, Storage and Utilization of Carbon Dioxide (the **CCUS Act**), came into effect on February 7, 2025. The CCUS Act regulates the efficient capture of CO_2 emitted from industrial activities, either for storage underground or to develop and industrialize technologies necessary for its industrial and daily use, with the aim of preventing further impact to the climate and contributing to sustainable development of the national economy.

604. The CCUS Act applies to capture facility operators who install and operate CO_2 capture facilities, transport facility operators who install and operate pipelines, exploration rights holders who discover storage sites, and storage operators who intend to carry out storage.

605. Storage operators must obtain permission from the Minister of Trade, Industry and Energy, and where CO_2 is to be stored in the ocean, from the Minister of Oceans and Fisheries.[355] Such permission is given in the form of a storage business license. If a storage operator fails to fulfil its obligations under the CCUS Act, causing significant hindrance to the storage of CO_2, the government may issue a corrective order.[356]

355 Article 18(1), CCUS Act.
356 Article 48, CCUS Act.

Transfer liabilities

Incoming Storage Operator

SNAPSHOT

Transfer liability under the CCUS Act largely applies in the case of suspension, restriction or correction orders, which will be enforced against an incoming storage operator.

606. Upon transfer of title to a CCS site, the CCUS Act imposes a reporting obligation on the following categories of incoming storage operators:[357]

a. the transferee, where the existing storage operator transfers all or part of the storage operations;

b. the surviving corporation or the newly established corporation in the case of a merger involving the existing storage operator;

c. the acquirer, where they take over all storage facilities of the existing storage operator whether by auction, realization, sale of seized property, or other similar procedures; or

d. the heir, where the existing storage operator passes away and the heir intends to succeed to the status of storage operator.

The report must be submitted within 30 days of the date of transfer in a, merger in b, acquisition in c, or on which the existing storage operator passed away in d above, along with all relevant documentation, to the Minister of Trade, Industry, and Energy (the **Minister**).[358] Upon receipt of the report, the Minister will review the contents of the report and the relevant certificates (business registration certificate, corporate registration certificate, etc.), and will accept the transfer provided that the report complies with the CCUS Act.[359]

607. If a report is not submitted, the Minister shall impose a fine of up to KRW 5 million on the incoming storage operator.[360]

608. The Korean government may issue a suspension order, a fine in lieu of up to KRW 30 million, a restriction order, or a cancellation order against a storage operator in the following circumstances.[361] Note that in circumstances a and c, only a cancellation order shall be issued:

a. if the storage business is permitted through false or other fraudulent means;

357 Article 20(1), CCUS Act.
358 Article 29, Enforcement Decree of the CCUS Act.
359 Article 20(4), CCUS Act.
360 Article 54(2)(3), CCUS Act.
361 Article 23(1), CCUS Act.

b. if the storage business fails to meet the licensing standards under the CCUS Act;[362]

c. if the person who obtained the storage business license falls into one of the disqualification categories as described in paragraph 622;

d. if the storage business is partially or fully suspended or closed without obtaining the necessary permits; or

e. if there is a violation of obligations regarding the state of carbon dioxide.

In circumstances falling under a to d above, a fine of up to KRW 20 million will be imposed concurrently with the order issued by the Korean government.[363]

609. Such orders, including any penalty imposed, will be passed on to the incoming storage operator for one year from the expiration date of the order's disposition period.[364] Similarly, if proceedings were underway prior to the transfer, they may be continued against the incoming storage operator. However, if the incoming storage operator is able to prove that they were unaware of the order, or of the illegal act which led to the order, the order or ongoing proceedings will not be enforced against them.

610. Upon transfer, the incoming storage operator will be solely responsible for day-to-day monitoring and operation of the site. The CCUS Act imposes certain obligations on the storage operator, including:[365]

a. taking necessary measures as detailed by Enforcement Decree to prevent harm and prevent leakage of stored CO_2;

b. notifying the Minister without delay where leakage has exceeded the thresholds prescribed by Enforcement Decree;

c. keeping records of operation;

d. undergoing regular annual inspections and irregular occasional inspections by the Minister; and

e. obtaining acceptance for any temporary suspension of operation.

611. According to the CCUS Act, storage operators are prohibited from engaging in the following actions when operating a storage facility:[366]

a. emitting carbon dioxide stored in the storage facility without the approval of the Minister;

b. operating the storage site in a manner different from the approved monitoring plan; and

362 Article 18(4) of the CCUS Act imposes various standards on a new applicant in order to receive a storage business license. Note that in the event of a transfer of the storage business license, the CCUS Act only requires a transferee to submit the transfer report; it does not obligate the transferee, nor empower the Minister, to carry out a re-assessment of whether the transferee meets the licensing standards set under Article 18. However, failure to meet such licensing standards remains a basis for imposition of a cancellation order, and the CCUS Act does not prevent the Minister from issuing an order based on this ground against a transferee after the transfer has been accepted.

363 Article 52(4)(1), CCUS Act.

364 Article 21, CCUS Act.

365 Article 28, CCUS Act.

366 Article 26, CCUS Act.

c. changing the storage site or monitoring facilities for reasons other than those prescribed by Enforcement Decree, or failing to operate the facilities normally without approval. [367]

612. Where the storage operator violates any of its obligations under the CCUS Act, the Korean government may issue a corrective order. In the event of a transfer, the public law liability for compliance with the order will be transferred, and the incoming storage operator will therefore be liable under public law to take measures to correct the violation.

Former Storage Operator

SNAPSHOT

Former storage operators may incur liability in the form of corrective orders, however, the CCUS Act does not specify whether former or current party will be responsible. Korean law generally provides that current storage operator will be liable instead.

613. Upon transfer of the site, the former storage operator ceases to be responsible for day-to-day operation of the site. However, it is possible that they may still bear civil liability to the incoming storage operator in certain circumstances.

614. In the event that the act causing the breach occurred before the transfer, the incoming storage operator was unaware of the violation at the time of the transfer, and the governmental order was issued after the transfer, the CCUS Act itself does not specify which party will be responsible for a corrective order. Korean law provides generally that the public law responsibility to comply with the order will transfer to the incoming storage operator.

Former Petroleum Titleholders

SNAPSHOT

Former petroleum titleholders may incur liability under the "polluter pays principle" where the petroleum titleholder's actions caused the environmental damage.

615. The CCUS Act does not contain explicit provisions regarding the statutory liability of depleted oil and gas field owners or operators. However, were such a scenario to arise, the depleted oil and gas field owners or operators may be responsible for liability in tort due to the "polluter pays principle".[368]

This principle states that those who cause environmental pollution or damage through their actions or business activities are responsible for preventing further damage, restoring the environment, and bearing the costs of remedying the damage. Therefore, if the basis for the corrective order is found to be attributable to the accidents of the former petroleum titleholders, they may still be subject to corresponding liability.

Post-closure liabilities

367 Article 34, Enforcement Decree of the CCUS Act.
368 Article 7, Framework Act on Environmental Policy.

SNAPSHOT

In order to close a storage site, the operator must obtain approval from the Minister of Trade, Industry, and Energy. This process involves establishing a monitoring plan, under which the storage operator will be responsible for monitoring the site for a period of 15 years after closure.

616. Upon deciding to close a storage site, the storage operator must undertake the following actions:[369]

a. establish a monitoring plan, which will include monitoring of the storage site for a period of 15 years after closure;

b. obtain approval of the monitoring plan from the Minister of Trade, Industry, and Energy prior to closing the storage site; and

c. regularly report to the Minister of Trade, Industry, and Energy on the implementation of the approved monitoring plan.

617. Matters to be covered by the monitoring plan are determined by Enforcement Decree, as are reporting procedures and the factors the Minister will consider in granting approval.

618. Once the monitoring plan has been submitted and approved, the storage operator must not operate the storage site in a manner different from the plan, change the storage site or monitoring facilities for reasons other than those prescribed by the CCUS Act, or fail to operate the facilities normally without approval, as detailed in paragraph 611.[370]

619. If these obligations are not fulfilled, the government may impose corrective orders, imprisonment, or fines (which can be imposed on individuals and/or the corporation itself).

620. The CCUS Act does not regulate obligations or liabilities after the 15-year monitoring period. This appears to be a legislative gap, which is likely to be amended once issues related to such scenarios arise. However, if such scenarios were to arise under the current legal framework, the "principle of ultimate state responsibility" (which applies in relation to the constitutional duty of environmental protection) would likely apply, and the Korean government would therefore be responsible for such situations where the storage operator can show it has correctly discharged its post-closure obligations.

369 Article 25, CCUS Act.
370 Article 26, CCUS Act.

Barriers to transfer

SNAPSHOT

In order to transfer a storage site, acceptance must be sought from the Minister of Trade, Industry, and Energy. Where the incoming storage operator falls within a disqualification category, a transfer will not be possible.

621. Any incoming storage operator must fulfil the reporting obligation under the CCUS Act.

622. Despite submitting a report which satisfies the requirements in paragraph 606, the Minister will not accept the transfer where the storage operator falls into one of the following disqualification categories:[371]

a. a person who is under guardianship;

b. a person who has been declared bankrupt and has not been reinstated;

c. a person who has been sentenced to imprisonment or a more severe punishment for specified criminal offences under the Criminal Act, or violations of the CCUS Act, and for whom two years have not passed since the completion or exemption of the sentence;

d. a person who has been sentenced to a suspended sentence of imprisonment for the crimes mentioned in the above c and is still within the suspension period; or

e. a corporation whose representative falls under any of the categories in the above a to d.

371 Article 19, CCUS Act.

Indonesia

Issue	Comment	Risk
Existence and robustness of CCS regime	Nascent and untested legislative framework	
Liability split between stakeholders	Liability regime focuses solely on existing CCS license holder	
Post-closure liability	Period of 10 years post closure	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Summary

623. CCS activities in Indonesia are governed under the following regulations:

a. President Regulation No. 14 of 2024 on the Implementation of Carbon Capture and Storage Activities (**PR 14/2024**);

b. Minister of Energy and Mineral Resources (**MEMR**) Regulation No. 16 of 2024 on the Organization of Carbon Storage in Carbon Storage Permit Areas (**MEMR 16/2024**);

c. MEMR Regulation No. 2 of 2023 on the Organization of CCS and CCUS for Upstream Oil-and-Gas Business Activities; and

d. PTK-070/SKKIA0000/2024/S9 on the Implementation of CCS and CCUS in Oil & Gas Work Areas.

624. Pursuant to the above regulations, CCS activities in Indonesia may be implemented based on 2 separate schemes:

a. implementation of CCS activities in oil & gas work areas by upstream oil & gas contractors (**Contractors**) based on a production sharing contract (**PSC**); and

b. implementation of CCS activities in "Carbon Storage Permit Areas" (i.e. areas which have been determined to be suitable for CCS activities by the MEMR) which may be granted to a broad range of parties (including Contractors) by way of obtaining certain permits issued by the MEMR to conduct CCS activities over the area.

Depleted oil and gas reservoirs may only be transferred from the Contractors to a third-party CCS project developer entity if the relevant Contractor allows such area to be tendered out as Carbon Storage Permit Area by MEMR (i.e. based on scheme b above). The CCS project developer entity that has been granted the Carbon Storage Permit Area will then be liable for the operations conducted in the area when undertaking CCS activities until its closure.

Upon closure, the CCS project developer entity must conduct post-closure monitoring for the next 10 years, after which the supervision and responsibility for the oil and gas work area (i.e. Carbon Storage Permit Area) will then be transferred to the State.[372]

Transfer liabilities

SNAPSHOT

The legislative framework does not contemplate transferring Carbon Storage Permit Areas from proponent to proponent, and as such, only the current holder will incur liability.

625. Under PR 14/2024 and MEMR 16/2024, depleted oil and gas reservoirs may only be transferred from the Contractors (who have existing rights over such reservoirs pursuant to a PSC with the government) to CCS project developers by allowing such area to be tendered out as Carbon Storage Permit Area to third-parties.[373]

626. Additionally, Indonesian regulations do not provide any possibility of transferring Carbon Storage Permit Areas from one entity to another.

627. Business entities incorporated in Indonesia can generally propose to MEMR certain areas to be determined as Carbon Storage Permit Areas.[374] In the event that there is potential for CCS in an oil & gas work area that is not exploited by the Contractor, then any of its affiliates or a third-party entity can propose such area to MEMR to be designated as a Carbon Storage Permit Area.[375]

628. In such a case, MEMR must first confirm the relevant Contractor's interest in carrying out CCS exploration activities and carbon storage operations in such area before offering the area to third parties.[376] Once the Contractor has confirmed that it has no interest in developing CCS activities, the MEMR will then offer the Carbon Storage Permit Area to a third-party entity.[377]

629. The CCS project developer entity that has been granted the Carbon Storage Permit Area will then be liable for the operations conducted in the area when undertaking CCS activities. This means that any leakage of carbon dioxide from the CCS storage area will then be the responsibility of such CCS project developer.[378]

630. Throughout the implementation of CCS activities, the CCS project developer must conduct periodic monitoring and reporting to MEMR every 6 months and for any incident (such as in the case of emergencies, accidents, or other disruptions) in order to ensure that the CCS activities are carried out safely, effectively and efficiently.[379] Upon the closure of CCS activities or transfer of all or part of the oil and gas work area to MEMR, the supervision and responsibility for the depleted reservoir where CCS activities have been carried out will then be transferred to the State through MEMR and the Directorate General of Oil & Gas.[380]

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372 Articles 62-69, MEMR 16/2024.
373 Article 10 & 13, PR 14/2024 and Article 3(6), MEMR 16/2024.
374 Article 10, PR 14/2024 and Article 3(2), MEMR 16/2024.
375 Article 13, PR 14/2024.
376 Articles 3, MEMR 16/2024.
377 Article 3, MEMR 16/2024.
378 Article 40, MEMR 16/2024.
379 Articles 34, 36, 40 and 68, MEMR 16/2024.
380 Articles 62-69, MEMR 16/2024.

Post-closure liabilities

SNAPSHOT

Following continuous monitoring over the storage site for a minimum 10 year period, supervision responsibility for the oil and gas work area will be transferred to the State.

631. Under the Indonesian regulations, the CCS project owner must conduct continuous monitoring over the storage site for a period of 10 years post-closure to assess certain risks such as leakage or contamination.[381] The CCS project owner must also set aside post-operational guarantee funds for closure and monitoring, which will be managed jointly with the Directorate General of Oil and Gas under MEMR.[382]

632. At the end of this post-closure monitoring phase, the supervision and responsibility for the oil and gas work area (which is permitted as a Carbon Storage Permit Area) where CCS activities have been carried out will then be transferred to the State.

Barriers to transfer

633. The implementation of CCS in Carbon Storage Permit Areas requires the following 2 permits issued by MEMR:

a. Exploration Permit: this permit grants the right to the CCS project developer to conduct exploration activities in the Carbon Storage Permit Area;[383] and

b. Storage Operation Permit: this permit grants the right to the CCS project developer to inject carbon dioxide into an injection target zone and storage activities within the Carbon Storage Permit Area.[384]

PR 14/2024 restricts the transfer of the above licenses for CCS activities.[385] Furthermore, the regulation also provides that the majority of shares in a business entity holding:

c. an Exploration Permit can only be transferred after the business entity/permanent establishment has implemented its exploration activities and subject to MEMR approval;[386] and

d. a Storage Operation Permit can only be transferred after obtaining approval from MEMR, who will consider the sustainability of permanent and safe carbon storage operations in accordance with the provisions set out in the Storage Operation Permit.[387]

381 Article 69, MEMR 16/2024.
382 Articles 62-69, MEMR 16/2024.
383 Article 1(9), MEMR 16/2024.
384 Article 1(11), MEMR 16/2024.
385 Articles 17 & 25, PR 14/2024.
386 Article 19, PR 14/2024.
387 Article 27, PR 14/2024.

Malaysia

Peninsular Malaysia and Labuan

Issue	Comment	Risk
Existence and robustness of CCS regime	Nascent and untested legislative framework	
Liability split between stakeholders	No distinction between former and current Storage License holders and is unclear whether transfer of Storage Licenses would be allowed	
Post-closure liability	Remain liable for decommissioning obligations under the LCSR and continue to bear responsibility for any residual risks discovered post-handover	
Security requirements	Yes there are security requirements	
Overall legislative and regulatory risk		

Sarawak

Issue	Comment	Risk
Existence and robustness of CCS regime	Nascent and untested legislative framework	
Liability split between stakeholders	Does not draw a distinction between former and current Storage Permit holders and is unclear whether transfer of Storage Permits would be allowed	
Post-closure liability	Storage Permit holders are required to carry out post-closure activities for at least 20 years	
Security requirements	No security requirements	
Overall legislative and regulatory risk		

Summary

634. Malaysia is a federation comprising 11 states and 2 federal territories in Peninsular Malaysia, and 2 regions (Sabah and Sarawak) and 1 federal territory in Borneo.

635. CCUS activities in Peninsular Malaysia and the Federal Territory of Labuan in Borneo are intended to be governed by an Act of Parliament (when it comes in force[388]) which currently is in the form of a Bill known

388 Kindly note that as of the date of this report, the CCUS Bill has yet to become an Act of Parliament. While it has been passed in the Malaysian parliament, it remains pending royal assent and will only take effect on a date to be appointed by the relevant Minister via gazette. For the purposes of this report, we have assumed that the CCUS Bill will come into legal effect as an Act of Parliament in its current form.

as the Carbon Capture, Utilization and Storage Bill 2025 (**CCUS Bill**). The Sarawak Land Code 1958 (**SLC**) and its subsidiary legislation, the Land (Carbon Storage) Rules 2022 (**LCSR**) govern CCUS activities in Sarawak[389], whilst Sabah has yet to enact any legislation specifically governing CCUS activities within its jurisdiction.

636. Neither the CCUS Bill nor the LCSR specifically imposes carbon storage obligations onto former Storage License[390] / Storage Permit[391] holders or otherwise holds them liable for any failure of such carbon storage. Liability for carbon storage operations is imposed solely on current holders, which include obligations for monitoring, and undertaking corrective and remediation measures. These obligations generally continue post-closure, but may be transferred to the government (or in the case of the LCSR, the Licensee[392]) upon satisfaction of certain conditions.

637. In relation to post-closure liabilities, the LCSR sets a default minimum period of 20 years before post-closure obligations can be transferred, unless otherwise approved by the Sarawak State Planning Authority (**Authority**). Liability is subsequently transferred to the Licensee upon termination of the storage permit by the Authority. Under the CCUS Bill, post-closure obligations are transferred to the government only after a prescribed period has passed following the issuance of a closure certificate, and subject to the fulfilment of any additional conditions specified within that certificate. Notwithstanding the transfer of post-closure obligations, the government retains the right under both frameworks to take action against the Storage License or Storage Permit holder for any liabilities arising from the holder's fault, negligence, deceit, or failure to exercise due diligence.

638. Both the CCUS Bill and the LCSR do not allow the conversion of rights held by petroleum operators into rights as storage site operators. Petroleum operators are still required to apply for a Storage License or Storage Permit, even if the proposed storage operations are to be carried out within the same area.

639. Lastly, while neither the CCUS Bill nor the LCSR expressly prohibits the transfer of Storage Licenses or Storage Permits respectively, such transfers are generally subject to restrictions imposed by the relevant authority through conditions under the license or permit. These typically require the prior consent of the relevant authority before any transfer can be effected.

389 The LCSR applies to both onshore and offshore CCUS activities conducted within the boundaries of Sarawak.
390 Defined in paragraph 640 below.
391 Defined in paragraph 648 below.
392 Defined in paragraph 645 below.

Transfer liabilities

Storage License Holders - Peninsular Malaysia and Labuan

SNAPSHOT

There is no distinction between former and current Storage License holders under the CCUS Bill. It is unclear whether transfer of Storage Licenses would be allowed, and if so, whether trailing liabilities would apply. Based on the current form of the CCUS Bill, Storage License holders are solely liable for all operational obligations and eventual post-closure liabilities.

640. Under the CCUS Bill, operators of storage sites (**Operators**), are required to obtain storage licenses (**Storage License**) issued by the Malaysia Carbon Capture, Utilization and Storage Agency (**Agency**).

641. The CCUS Bill does not allow the conversion of petroleum sites into storage sites. Petroleum operators are still required to apply for a Storage License, even if the proposed storage operations are intended to be carried out within the same area.

642. The CCUS Bill also does not distinguish between former and current Storage License holders, and as such, it provides no clear guidance on how liabilities would be allocated or transferred between Storage License holders in the event a transfer is permitted. Based on the current form of the CCUS Bill, sole liability is placed on the Storage License holder for the operation of the storage site. This includes obligations to:[393]

a. provide information relevant for the purpose of assessing compliance with storage license conditions;

b. monitor the storage complex and surrounding environment and prepare a monitoring plan;

c. carry out any corrective measures and remediation measures with regards to any leakage or significant irregularity;[394] and

d. submit the report in relation to the result of the monitoring undertaken under paragraph b above and any measure undertaken under paragraph c above to the Agency.

643. Throughout the operation lifespan of a storage site, the minister has broad discretionary powers to make regulations to bind current Storage License holders.[395] Such regulations may relate to:[396]

a. the injection of carbon dioxide streams into a storage site;

b. the Storage License holders obligations relating to the operation of a storage site; and

c. other prudent carbon capture, utilization and storage practices,

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393 CCUS Bill, ss 29, 38.

394 Further examples of significant irregularity include where condition of the storage complex indicates the risk of a leakage or risk to the environment or human health.

395 CCUS Bill, s 52(1).

396 CCUS Bill, s 52(2).

where a breach of such regulations constitutes an offence for which the Storage License holder may be liable to a prescribed penalty.[397]

644. Storage License holders are also subject to various site-closure obligations and post-closure obligations once storage site has been closed. Please see paragraph 656 below.

Licensees – Sarawak

SNAPSHOT

The former Licensee is required to ensure safe and uninterrupted operations during the License transition period. The storage operator remains liable for monitoring and corrective obligations during this period, but all future obligations will be passed to the new Licensee upon transfer. However, the LCSR is silent on whether trailing liabilities apply following the transfer.

645. In Sarawak, a license to use land for carbon storage is granted under Section 32B of the Land Code and issued pursuant to the LCSR (**License**).[398] If the holder of such license (**Licensee**) intends to carry out carbon storage activities, a separate storage permit is required.[399]

646. Upon the expiry or revocation of a License by the Authority, where storage permits for storage sites remain in force, the Authority may approve the issuance of a new License. During the transition period between the expiry of the existing License and the grant of a new one, the former Licensee is required to:

a. take all necessary steps to ensure safe and uninterrupted operation of the storage site;[400]

b. not accept any scheduled gases for storage;[401]

c. continue monitoring the storage site and submit weekly report of its condition to the Director;[402] and

d. take corrective measures to contain any leakage of scheduled gases already stored in the storage site.[403]

647. Upon the transfer of the License, obligations relating to the day-to-day operations of the License, passes to the new Licensee. However, former Licensees would still be liable for decommissioning activities in accordance with the approved plan by the Authority.[404] The LCSR is also silent on whether trailing liabilities apply following the transfer.

397 CCUS Bill, s 52(3).
398 LCSR, r 11(1).
399 Please refer to paragraph 648.
400 LCSR, r 21(2).
401 LCSR, r 30(2)(a).
402 LCSR, r 30(2)(b)(i).
403 LCSR, r 30(2)(b)(ii).
404 LCSR, paragraph 2 of the terms and conditions of the storage license in the Second Schedule.

Storage Permit Holders – Sarawak

SNAPSHOT

The LCSR does not draw a distinction between former and current Storage Permit holders. It is unclear whether transfer of Storage Permits would be allowed, and if so, whether trailing liabilities would apply. Based on the LCSR, Storage Permit holders and Licensees are jointly and separately liable for all operational obligations and eventual post-closure liabilities.

648. In Sarawak, any person intending to carry out carbon storage activities are required to obtain a storage permit issued by the Superintendent of Lands and Surveys (**Storage Permit**). Notably, a Storage Permit can only be applied for through Licensee, and carbon storage activities may only be conducted within the licensed area held by the Licensee[405]. A Licensee can apply for a Storage Permit on its own behalf.

649. The LCSR does not delineate liability between former and current Storage Permit holders. The Storage Permit holder and Licensee are jointly and severally liable for fulfilling all obligations and duties imposed under the relevant Storage Permit and License, notwithstanding any engagement or appointment of a storage operator[406], who is responsible for the day-to-day operation and safety of the storage site and is obligated to report any damage caused to the storage site.[407]

650. Where any significant irregularity in relation to the injection process, storage operation or the site has occurred (e.g. leakage of scheduled gas),[408] the Director of Lands and Surveys may issue corrective orders to the current Licensee, Storage Permit holder or storage operator, jointly or separately.[409] A breach of such an order constitutes an offence liable for a prescribed penalty.[410]

651. Storage Permit holders are further subject to various site-closure obligations and post-closure obligations upon closure of the storage site. Please see paragraph 661 below.

Former Petroleum Operators – Sarawak

SNAPSHOT

Former petroleum license holders remain liable for decommissioning obligations under the LCSR and continue to bear responsibility for any residual risks discovered post-handover.

652. The LCSR expressly states that the petroleum operators[411] have no implied right to a carbon storage license or Storage Permit over an abandoned petroleum site which has been decommissioned and possession

405 A license to use land for carbon storage is granted under Section 32B of the Sarawak Land Code and issued pursuant to the LCSR.
406 LCSR, r 34(7).
407 LCSR, rr 36 (1) – (3).
408 LCSR, r 36(3). Further examples include where there is damage to injection facilities and transportation facility or system, or in the case of a storage site in offshore land, where the there is damage to the marine ecosystem in the vicinity, or where any incident resulted in death or severe physical injury to person at the storage site.
409 LCSR, r 36(4).
410 LCSR, r 36(5).
411 "petroleum operator" includes any person who has been exploring or producing petroleum in any part of onshore or offshore land of the State of Sarawak.

thereof.[412] Hence, petroleum operators would still need to apply for a Storage Permit even if storage operations are intended to be conducted in the same area.

653. Under the LCSR, petroleum operators are liable to undertake decommissioning works and activities at its own costs and expenses before handing over of the site to the Superintendent to be used as carbon storage.[413] Failure to do so constitutes an offence liable for a prescribed penalty.[414]

654. Notwithstanding the handover of the abandoned petroleum site, the petroleum operator remains liable for any residual remains after the decommissioning, including any significant irregularities discovered subsequent to the handing over of the abandoned petroleum site.[415]

655. The LCSR currently does not provide a mechanism for the direct conversion of an abandoned petroleum site into a storage site. If a petroleum operator intends to do so, it must first comply with all relevant decommissioning and related obligations[416] under the LCSR. Once the site is properly decommissioned, the site can then be formally handed over to the Superintendent[417], who may then assess and determine whether the site may be designated as a licensed area[418] under the LCSR framework.

Post-closure liabilities

Peninsular Malaysia and Labuan

SNAPSHOT

Former petroleum license holders remain liable for decommissioning obligations under the LCSR and continue to bear responsibility for any residual risks discovered post-handover.

656. Following the closure of a storage site the current storage license holder remains responsible for monitoring the storage site, carrying out corrective measures and remediation measures, and undertaking any other prescribed activities.

657. In respect of offshore storage, these obligations may only be transferred to the government when the prescribed conditions for closure have been complied with.[419] Upon which, the Agency will issue a closure certificate.[420] For onshore storage, the transfer of obligations is determined by the minister after consultation with the respective state government.[421]

658. The transfer of other obligations will only occur if:

a. a prescribed period has lapsed from the issuance of the closure certificate; and

b. all other prescribed conditions in the closure certificate have been fulfilled.

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412 LCSR, r 9.
413 LCSR, rr 6(2), 7(1)
414 LCSR, r 7(2).
415 LCSR, r 6(5).
416 LCSR, rr 5, 6, 7, 10.
417 LCSR, r 5.
418 LCSR, r 8.
419 CCUS Bill, ss 31(2), 32(1).
420 CCUS Bill, s 31(1).
421 CCUS Bill, s 40.

659. However, the CCUS Bill does not specify the duration of the prescribed period or the content of the prescribed conditions. It is likely that these matters will be addressed in subsequent regulations, as the Minister is empowered to prescribe conditions for:

a. the closure of a storage site and issuance of a closure certificate;

b. the transfer of obligations to the government following site closure; and

c. the transfer of obligations to the state government following state-level consultation.[422]

660. Notwithstanding the transfer of obligations, the current storage license holder will remain liable for any criminal, contractual or civil liability for any breach or damage arising from the fault, negligence, fraud or failure to exercise due diligence on the part of the storage user.[423]

Sarawak

SNAPSHOT

Under the LCSR, Storage Permit holders are required to carry out post-closure activities for at least 20 years, after which the Authority may terminate the Storage Permit. Operators remain liable for any breach attributable to their fault, negligence, or failure to exercise due diligence.

661. Where the storage user intends to close the storage site, the storage operator must make an application to the Authority for approval.[424] Where the approval is given, the storage site may only be closed if:

a. all conditions attached to the Authority's approval are complied with;[425] and

b. a proposed post-closure plan, taking into account relevant risks, current best practice and any improvements in the available technology, has been submitted and approved by the Authority.[426]

662. Notwithstanding the closure of the storage site, the current Licensee, Storage Permit holder or storage operator remain liable for any breach or non-compliance with LCSR and the conditions of the license and storage permit which occurred prior to such closure.[427]

663. The Storage Permit holder then remains responsible for monitoring, reporting of leakages and significant irregularities, and undertaking corrective measures for a minimum period of 20 years after closure,[428] subject to the Authority's discretion to reduce such period,[429] before the Storage Permit may be terminated.

664. Upon expiry of the 20-year period, or such other reduced period, the Authority will determine the amount and form of financial contribution from the storage user to cover the estimated post-transfer costs.[430]

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422 CCUS Bill, ss 53(2)(i), (j), (k).
423 CCUS Bill, s 32(3).
424 LCSR, s 39(3).
425 LCSR, s 39(2).
426 LCSR, s 40.
427 LCSR, s 41(1).
428 LCSR, ss 41(3), (4).
429 LCSR, s 41(5).
430 LCSR, s 42.

665. A termination notice may only be served where the Authority is satisfied that the stored scheduled gases will be completely and permanently contained, the storage site has been sealed, and the injection facilities have been properly decommissioned.[431]

666. However, such termination does not affect any obligation imposed upon or liability incurred by the Licensee.[432] The Licensee remains liable to continue monitoring and take corrective measures,[433] until otherwise directed under the LCSR.

667. The storage user is required to indemnify the Authority against:

a. any leakage, liabilities and outstanding fees, levies, or payments incurred prior to the termination of the storage permit;[434] and

b. any post-transfer cost arising due to the fault, negligence, deceit or a failure to exercise due diligence on the part of the storage user.[435]

Barriers to transfer

Peninsular Malaysia and Labuan

SNAPSHOT
The CCUS Bill does not expressly provide for or prohibit the transfer of Storage Licenses. However, restrictions on transfers may be imposed through conditions attached to the Storage License.

668. The CCUS Bill is silent on whether the transfer of Storage Licenses is permitted. However, the Agency has the discretion to impose any conditions it deems appropriate when issuing a Storage License,[436] which may include restriction on transfers.

Sarawak

SNAPSHOT
Under the LCSR, Licenses are not transferable unless authorized in writing by the Authority. There is no express provision under the LCSR allowing or restricting the transfer of Storage Permits. However, restrictions on such transfers may be imposed through conditions attached to the Storage Permits.

669. Under the LCSR, a License cannot be transferred without prior approval of the State Planning Authority.[437] However, the LCSR does not specify the considerations that the Authority may take into account in granting such approval.

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431 LCSR, s 43(1).
432 LCSR, s 43(2).
433 LCSR, s 43(3).
434 LCSR. s 43(4).
435 LCSR. s 43(5).
436 CCUS Bill, ss 27, 36.
437 LCSR, r 31. See also paragraph 8 of the terms and conditions of the storage license in the Second Schedule.

Upon the transfer of a License, all active storage permits held under the former license automatically transfer to the current licensee, subject to such terms and conditions as the Authority may determine.[438] If the current Licensee intends to change the storage user or operator under the Storage Permit, prior notice must be given to the Director of Land and Surveys, at least three months for storage users,[439] and four weeks for storage operators.[440] However, additional terms and conditions may be imposed by the Director.[441]

438 LCSR, r 21(1).
439 LCSR, paragraph 5(3) of the terms and conditions of the storage permit in the Fourth Schedule.
440 LCSR, paragraph 5(4) of the terms and conditions of the storage permit in the Fourth Schedule.
441 LCSR, r 23(5).

Appendix A Phase 2 works – compare existing frameworks

Photo: Adobe Stock

Summary

670. This Phase 2 Works represents a comparative analysis of the Phase 1 Works, and consists of (1) a comparative matrix of key criteria; and (2) a comparative graph of the Selected Jurisdictions.

671. Selected Jurisdictions have been systematically scored in accordance with a proposed methodology across key regulatory criteria identified in the Phase 1 Works, with a scoring framework designed to provide a clear and comparative overview of how each jurisdiction performs relative to the other. As part of the methodology, weighting has been applied to each criteria. A detailed overview of our proposed methodology is set out below.

672. It is important to note the criteria assessed, and the weighting applied, have been viewed through a regulatory lens, and there is necessarily a subjective element associated with this. We note that technical and commercial factors will need to be overlayed into this report, which we have not considered in this analysis (i.e. sufficient carbon markets or incentives and other financial metrics which are critical to a Selected Jurisdiction's investability). However, this exercise is intended to be a "ready reckoner" / strawman to stimulate discussion, rather than a definitive determination and ranking of each jurisdiction.

Methodology

673. The Selected Jurisdictions have been scored based on the following parameters:

    a. the regulatory uncertainty of transfer liabilities pursuant to the respective CCS regime; and

    b. how such regulatory uncertainty would impact a license holder or operator of a CCS project.

674. A broad range of criteria which apply to CCS projects have been identified in the Phase 1 Works. These criteria represent common themes which are present in the majority of Selected Jurisdictions, or, based on regulatory uncertainty in conventional oil and gas projects, we would expect to also be relevant to CCS Projects. An initial list of 100 criteria were identified, which we have consolidated into 10 key categories. Such criteria can be broadly categorised into the following categories:

    a. Existence and robustness of CCS Regime (including pore space access, infrastructure permits, approvals to transport CO_2, etc);

    b. Liability split between stakeholders;

    c. Post-closure liability; and

    d. Security requirements.

675. All criteria have been worded to produce a quantitative binary "yes" or "no" result, i.e. they either apply to the Selected Jurisdiction or they do not apply to the Selected Jurisdiction. Where the criteria applies "yes", the jurisdiction will be graded an unweighted score of "1", and where the criteria does not apply "no", the jurisdiction will be graded a score of "0".

676. Additionally, a qualitative weighting has been applied to each criteria based on the regulatory and legislative impact such criteria pose on stakeholders. The rationale of applying a weighting is that certain criteria inherently have a more significant impact on a stakeholder's approach to CCS projects (e.g. ultimate

state liability is paramount), while some criteria are lower value. The weighting applied to each criteria is set out in the below table:

Weighting	Description
0%	Criteria considered baseline or foundational. These criteria do not have any impact on a license holder or operator's approach to CCS projects.
25%	Criteria that may introduce some considerations, however do not pose significant challenges on a license holder or operator's approach to CCS projects.
50%	Criteria that introduce a moderate level of consideration. License holders or operators may need to invest additional resources to ensure compliance or to clarify regulatory expectations.
75%	Criteria have a high level of impact on a license holder or operator, and additional resources will need to be invested to ensure regulatory compliance / execute a CCS project.
100%	Criteria that have a significant impact on a license holder or operator and such criteria will fundamentally alter the approach to a CCS project.

Key findings

677. We set out the following key findings based on the data calculated pursuant to Annexure A to Annexure D. We note that the observations below are within the confines of a limited scoring framework of 10 selected criteria given the approach taken on weighting, will include elements of subjectivity.

Lack of correlation between regulatory certainty and CCS project enablement

678. The data does not show a correlation between "comprehensive" CCS regimes and project enablement. This is because comprehensive regimes tend to favour stronger controls for the Government / State, and in turn, more stringent requirements on a CCS proponent.

679. For example, we are seeing more comprehensive CCS regimes include requirements for proponents to pay into a trust fund throughout the CCS project lifespan, with the purpose of funding post-closure remediation. Such requirements can have a direct impact on a CCS project's economic viability.

680. Additionally, comprehensive CCS regimes have introduced mechanisms to extend liability to former license holders (i.e. boomerang provisions or trailing liability). Such provisions fundamentally alter the risk profile of investing into CCS projects, as there is a potential continuing risk of a proponent incurring liability, even if they are no longer the existing license holder / operator. Alternatively, the more flexible regimes lack these mechanisms, and as a result have scored higher scores.

681. As such, the greater the protection the CCS regime affords to the Government / State, the lower the score the relevant jurisdiction has scored when compared against less developed regimes.

Transfer of liability to the Government / State post monitoring

682. Jurisdictions that allow for liability to transfer to the Government / States post-closure scored higher compared to Jurisdictions that do not include this mechanism.

683. Not having a mechanism to allow for the transfer liability to the Government / States post-closure introduces significant uncertainty for a CCS proponent, as such proponent may retain unknown residual liabilities in relation to a CCS project.

684. We note however, that while mechanisms for transfer of long-term liability can improve investment certainty, it is still recommended that CCS projects are appropriately underpinned by robust site selection, monitoring and remediation obligations to ensure appropriate environmental protection and public confidence.

US Federal regime vs US State regimes

685. US States that have obtained primacy or have dedicated CCS regimes scored higher compared to US States who are still governed under the US Federal regime. Additionally, both Wyoming and New Mexico have CCS specific legislation, that introduce explicit regulations on post-closure liability transfer to the States, and short minimum timeframes for post-closure monitoring.

Annexure A – Criteria

No.	Regulatory criteria	Category	Weighting	Reasoning
1	Does the jurisdiction have a dedicated CCS legal and regulatory framework?	Existence and robustness of CCS Regime	100%	Contrast the view that the lack of a CCS regime may be preferable in some jurisdictions as there can be creation of a project specific, bespoke regime with the Government. There are pros and cons for both options, however, for purposes of this report, we have taken the view that a dedicated regime is beneficial for a stakeholder as it demonstrates a desire for investment. Whereas the absence of a dedicated regime introduces significant uncertainty for stakeholders.
2	Does the legal and regulatory framework for CCS demonstrate alignment with key international treaties and standards such as the London Protocol, OSPAR Convention, and UNCLOS?	Existence and robustness of CCS Regime	25%	Alignment between domestic and international law creates certainty (although there is an argument that a lack of alignment may create opportunity).
3	Does the regime predominantly focus on liability of the existing license holder (i.e. former license holders may be liable only in exceptional circumstances), and is that liability delineation clear?	Liability split between stakeholders	100%	Whether a CCS regime focuses predominantly on liability of existing license holders or extends to former license holders will fundamentally alter liability considerations of a stakeholder undertaking a CCS project. However, we acknowledge, given many, if not all projects are nascent, this is a future issue.
4	Is a previous petroleum license holder relieved of liability upon a CCS license being established over the corresponding reservoir / assets?	Liability split between stakeholders	100%	For conventional oil and gas projects that are converted, is there legacy liability for the petroleum titleholder i.e. can there be a “clean exit” where there may be a different operator or third party customers.

No.	Regulatory criteria	Category	Weighting	Reasoning
5	Is there a mechanism for liability transfer (separate to an indemnity) to the state/government after a defined post-closure period?	Post-closure liability	100%	The ability to transfer existing liability to the state/government fundamentally alters liability considerations of a stakeholder undertaking a CCS project.
6	Are there explicit post-closure monitoring requirements?	Post-closure liability	25%	While the specifics of this require technical consideration, our understanding is that industry has factored this requirement in and therefore is low risk.
7	Is the minimum length for the post-closure monitoring period less than or equal to 20 years?	Post-closure liability	50%	The minimum length of a CCS regime's post-closure liability will impose additional costs and liability on a stakeholder undertaking a CCS project. However, altering the minimum length will not necessarily impose greater regulatory uncertainty for a stakeholder.
8	Is there a government indemnity or guarantee for long-term liabilities post-closure (except for grossly negligent / wilful misconduct type behaviour)?	Post-closure liability	100%	Whether a state/government will provide an indemnity or guarantee for long-term liability fundamentally alters a proponents "clean exit" strategy" and has a significant impact on its economics.
9	Are there financial security regulatory requirements (e.g., bonds, insurance)?	Security requirements	50%	While we expect financial security / assurance instruments will be a baseline expectation for most projects, the extent and form of the security will have a significant impact on a project's economics.
10	Are there trust fund JV requirements or similar mechanisms for the post-closure period?	Security requirements	50%	While an explicit requirement to maintain a trust fund or similar mechanism during the operation of a CCS project introduces additional obligations on a stakeholder this obligation does not detract from the reality that costs will be necessary to undertake long-term site care and remediation, regardless of whether early investment is mandated. However, the extent and form of the security will have a significant impact on a project's economics.

Annexure B – comparative matrix

Regulatory criteria	1	2	3	4	5	6	7	8	9	10
US – Federal	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	No
US – Wyoming	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US – Louisiana	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
US – Texas	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes
US – California	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes
US – Illinois	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
US – New Mexico	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Brazil	Yes	N/A	No	No	No	No	No	No	No	Yes
The United Kingdom	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Canada Alberta	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Denmark	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Australia – Commonwealth	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
Australia – Victoria Offshore	Yes	Yes	No	Yes	No	Yes	N/A	No	Yes	No
Australia – Victoria Onshore	Yes	Yes	Yes	Yes	Yes	Yes	N/A	No	Yes	No
Australia – Queensland	Yes	Yes	Yes	Yes	No	Yes	N/A	No	Yes	No
Australia – South Australia	Yes	Yes	Yes	Yes	No	Yes	N/A	No	Yes	No
Australia – Western Australia	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
Italy	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
Korea	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No
Indonesia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Malaysia – Peninsular & Labuan	Yes	Yes	N/A	Yes	No	Yes	N/A	No	No	No
Malaysia – Sarawak	Yes	Yes	N/A	Yes	No	Yes	Yes	No	No	No

Annexure C – jurisdiction scores: weighted data

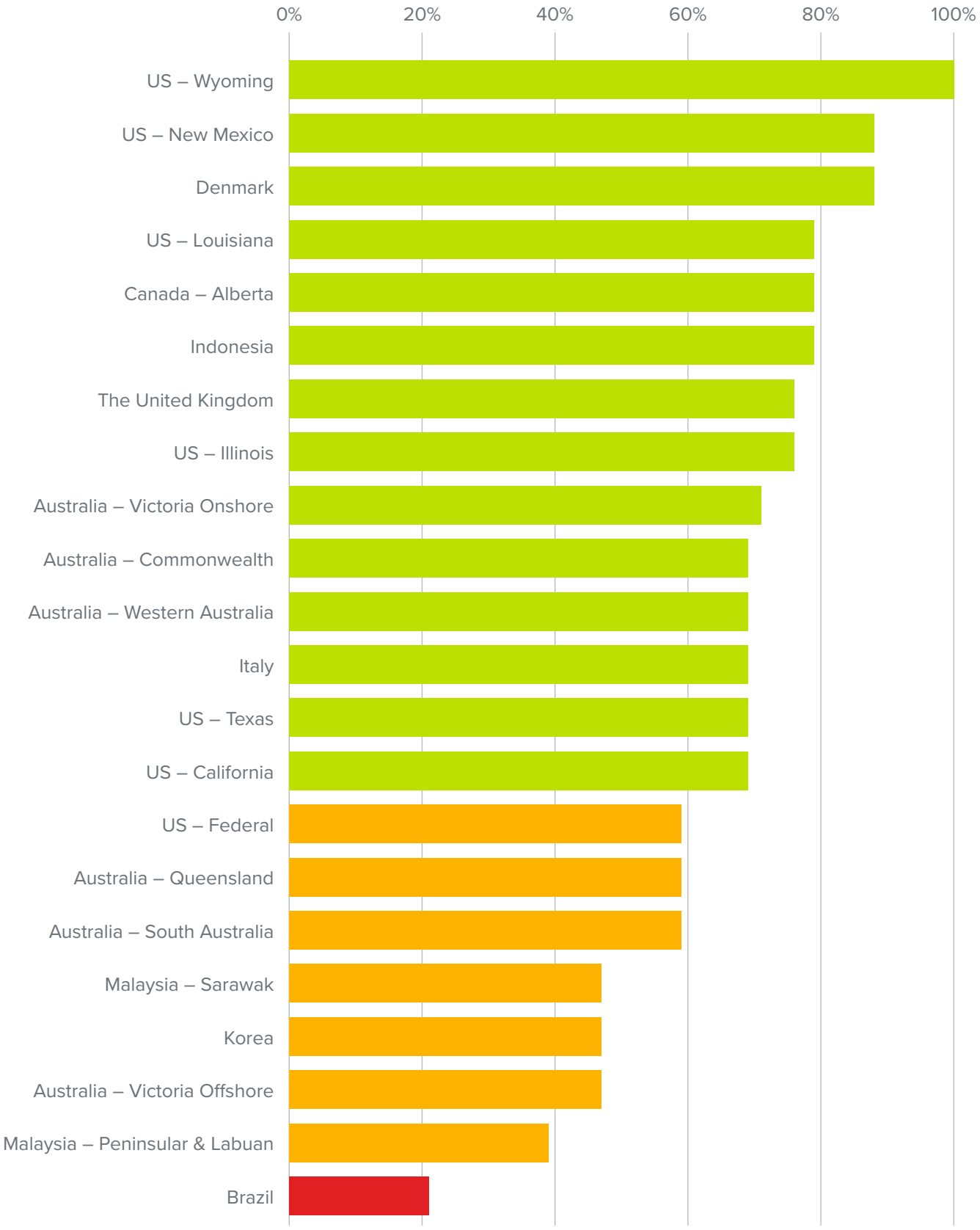
Jurisdiction	Score out of a weight score of 17	Score percentage
US – Wyoming	17	100.00%
US – New Mexico	15	88.24%
Denmark	15	88.24%
US – Louisiana	13.5	79.41%
Canada Alberta	13.5	79.41%
Indonesia	13.5	79.41%
The United Kingdom	13	76.47%
US – Illinois	13	76.47%
Australia – Victoria Onshore	12	70.59%
Australia – Commonwealth	11.5	67.65%
Australia – Western Australia	11.5	67.65%
Italy	11.5	67.65%
US – Texas	11.5	67.65%
US – California	11.5	67.65%
US – Federal	10	58.82%
Australia – Queensland	10	58.82%
Australia – South Australia	10	58.82%
Malaysia – Sarawak	8	47.06%
Korea	8	47.06%
Australia – Victoria Offshore	8	47.06%
Malaysia – Peninsular & Labuan	6.5	38.24%
Brazil	3.5	20.59%

*the colour coding above is as follows:

- Score Percentage < 33% = Red
- Score Percentage 33% < X < 66% = Yellow
- Score Percentage > 66% = Green

Annexure D – comparative graph

Selected jurisdiction comparative analysis



Glossary of terms

Term	Meaning
Agency	means the Emergency Management Agency.
Agreement Holder	has the meaning given to it in section 316.
ANP	means the Brazilian National Agency for Petroleum, Natural Gas and Biofuels.
BOEM	means the Bureau of Ocean Energy Management.
BSEE	means the Bureau of Safety and Environmental Enforcement.
CalGEM	means the California Geologic Energy Management Division.
CARB	means the California Air Resources Board.
CCS	means Carbon Capture and Storage.
CCS Executive Order	Means the Danish CCS Executive Order.
CCS Law	has the meaning given to it in section 261.
CCUS Act	means the Act on the Capture, Transport, Storage and Utilization of Carbon Dioxide.
CCUS Bill	means the Carbon Capture, Utilization and Storage Bill 2025.
CDM	means Clean Development Mechanism.
Chapter 5	has the meaning given to it in section a.
Chapter 24 Regulations	has the meaning given to it in section a.
Chapter 121	has the meaning given to it in section a.
Class VI Rule	means the rule issued by EPA on December 10, 2010 establishing a new well class.
CNRA	means the California Natural Resources Agency.
Contractors	means the upstream oil & gas contractors.
CoUR	means “change in use relief”.
CSA	means Carbon Sequestration Agreement.
CSTR	means the *Carbon Sequestration Tenure Regulation*.
DBA	means the Danish Business Authority.
DEA	means the Danish Energy Agency.
DEQ	means the Department of Environmental Quality.

Term	Meaning
DISA	means the Danish Investment Screening Act.
DOI	means the Department of the Interior.
DSA	means the *Danish Subsoil Act*.
EEZ	means the exclusive economic zone.
EPA	means the Environmental Protection Agency.
EPBC Act	means the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).
EOR	means Enhanced Oil Recovery.
EQ Act	has the meaning given to it in section a.
ERA	means the *Energy Resources Act 2000* (SA).
ERR	means the *Energy Resources Regulations 2013* (SA).
E&P	means exploration and production.
FATA	means the *Foreign Acquisitions and Takeovers Act 1975* (Cth).
FIRB	means the Foreign Investment Review Board.
General Permit	means permission granted in advance and in accordance with Annex III of the 1972 London Convention.
GGS Act	means the *Greenhouse Gas Storage Act 2009* (Qld).
GGS authorisation	means greenhouse gas storage authorisation.
GGS Decree	means Legislative Decree No. 162/2011.
GGS Regulation	means the *Greenhouse Gas Storage Regulation 2021* (Qld).
GGS Titleholder	means greenhouse gas storage titleholder.
GHG	means greenhouse gas.
Golden Power Regulation	has the meaning given to it in section 599.
GSCD Act	means the Geological Sequestration of Carbon Dioxide Act.
Injector	has the meaning given to it in section b.
IPCC	means the Intergovernmental Panel on Climate Change.
Italian Environmental Code	means Legislative Decree No. 152/2006.
JOA	means a Joint Operating Agreement.
Law No. 14,993/2024	has the meaning given to it in section 261.

Term	Meaning
LCSR	means the Land (Carbon Storage) Rules 2022.
License	has the meaning given to it in section 645.
Licensee	means the holder of a Storage License.
Licensing Regulations	means the Storage of Carbon Dioxide (Licensing etc.) Regulations 2010.
LNDR	means the Louisiana Department of Natural Resources.
MEMR	means the Minister of Energy and Mineral Resources.
MEMR 16/2024	means the MEMR Regulation No. 16 of 2024 on the Organization of Carbon Storage in Carbon Storage Permit Areas.
Minister	means the Minister of Energy and Minerals
MMA	means the Alberta *Mines and Minerals Act*.
MMV	means Monitoring, Measurement and Verification plan.
NDCs	means nationally determined contributions.
NOPSEMA	means the National Offshore Petroleum Safety and Environmental Management Authority.
NSTA	means the North Sea Transition Authority.
OCS	means the Outer Continental Shelf.
Onshore	means the greenhouse gas storage titles that are located on the land within the State of Victoria.
Onshore legislation	means the GGGS Act and the GGGS Regulations.
Operators	means the operators of storage sites.
OPGGSA	means the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*.
OPGGSA (Vic)	means the *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic).
OPGGS Regulations (Vic)	means the *Offshore Petroleum and Greenhouse Gas Storage Regulations 2021* (Vic).
OPRED	means the Offshore Petroleum Regulator for Environment and Decommissioning.
Original Assignee	has the meaning given to it in section 358.
PGERA	means the *Petroleum and Geothermal Energy Resources Act 1967* (WA).
Phase 1 Works	has the meaning given to it in section a.
Phase 1A Works	has the meaning given to it in section b.

Term	Meaning
Phase 2 Works	has the meaning given to it in section c.
PLAA	means the *Petroleum Legislation Amendment Act 2024* (WA).
PPA	means the *Petroleum Pipelines Act 1969* (WA).
Primacy	has the meaning given to it in section 162.
PR 14/2024	means President Regulation No. 14 of 2024 on the Implementation of Carbon Capture and Storage Activities.
PSC	means production sharing contract.
PSLA	means the *Petroleum (Submerged Lands) Act 1982* (WA).
Queensland Regime	means the Resources Act and the Resources Regulation.
RANP 17	means ANP Resolution No. 17/2015.
RANP 785	means ANP Resolution No. 785/2019.
RANP 817	means ANP Resolution No. 817/2020.
Resources Act	means the *Mineral and Energy Resources (Common Provisions) Act 2014* (Qld).
Resources Regulation	means the *Mineral and Energy Resources (Common Provisions) Regulation 2016* (Qld).
RRC	means the Railroad Commission of Texas.
SA CCS Legislation	means the ERA and the ERR.
SB 905	has the meaning given to it in section a.
SDR	means Special Drawing Right.
SDWA	means the Safe Drinking Water Act.
Sea Dumping Act	means the *Environment Protection (Sea Dumping) Act 1981* (Cth).
Selected Jurisdictions	means: United States of America (Illinois, California, Louisiana, New Mexico, Wyoming, Texas); Brazil; United Kingdom; Canada (Alberta); Denmark; Australia; Italy; Korea; Indonesia; and Malaysia.
SLC	means the Sarawak Land Code 1958.
SOIs	means states of interests.
Special Permit	means permission granted specifically on application in advance and in accordance with Annex II and Annex III of the 1972 London Convention.
Storage License	has the meanings given to it in section 293 and 640.

Term	Meaning
Storage Permit	has the meaning given to it in section 648.
Termination Regulations	means the Storage of Carbon Dioxide (Termination of Licenses) Regulations 2011.
UIC	means Underground Injection Control.
US	means the United States.
Victorian Offshore CCS Legislation	means the OPGGSA (Vic) and the OPGGS Regulations (Vic).
WA CCS Legislation	has the meaning given in section 538.

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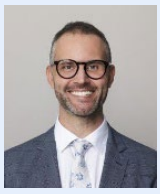

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