

CAPTURING CHANGE: A PROPOSAL FOR TEXAS TO ASSUME LONG-TERM LIABILITY FOR CARBON STORAGE FACILITIES

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ABSTRACT

To achieve energy sustainability and the federal government's goal of a net-zero economy to combat climate change, investment in carbon capture and storage (CCS) facilities is crucial. The primary incentive available is the 45Q federal tax credit; however, this tax credit is a double-edged sword because if any carbon dioxide (CO₂) leakage occurs, the taxpayer must return any benefit received from the tax credit. Additionally, the Environmental Protection Agency (EPA) implements high flaring penalties with the purpose of regulating flaring to reduce emissions. However, the Texas Railroad Commission (RRC) grants most permits for operators to flare in oil and gas operations, directly conflicting with energy sustainability objectives and leading to increased emissions. Thus, the 45Q tax credit and flaring penalties result in a broken carrot and stick system because the leniency of the RRC towards flaring disincentivizes investors to invest in carbon capture technologies. This discourages operators because not only are flaring penalties lightly enforced, but there are also high costs and potential liabilities that are associated with carbon capture and sequestration.

This Comment discusses the existing incentives available to operators of CCS facilities in Texas and addresses how these current incentives are insufficient to encourage investment when considering the challenges, costs, and potential liabilities associated with carbon capture technology. The current laws in Texas indefinitely place liability on the operator; however, these laws disincentivize operators to invest in carbon facilities especially when considering the leniency of the RRC towards flaring. Thus, Texas should adopt legislation that shifts long-term liability from operators of onshore carbon storage facilities to the state. Shifting liability will encourage investment in carbon sequestration in Texas and remedy the current inadequate imbalance existing between the current incentives available and

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costs and potential liabilities that operators of carbon storage facilities may face. To formulate a clear legislative framework, this Comment also explores other issues that are directly related to carbon storage such as primacy and pore space ownership.

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I. INTRODUCTION

In July of 2024, Marathon, a large American petroleum company, violated the Clean Air Act by illegally polluting the Fort Berthold Indian Reservation in North Dakota.¹ Per a settlement with the Environmental Protection Agency (EPA), Marathon is required to pay a civil penalty of \$64.5 million and expend \$177 million in compliance measures, totaling an estimated \$241.5 million in fines.²

The recent fine Marathon received in its settlement with the EPA for violating air quality requirements on its oil and gas operations is a prime example of how the 45Q federal tax credit and associated flaring penalties act as a broken carrot and stick system because the costs to invest and operate carbon capture and storage (CCS) facilities are astronomical.³ Similarly, the penalties enacted for flaring are high.⁴ However, the Railroad Commission of Texas (RRC) is lenient towards flaring, granting most permits for operators to flare which disincentivizes investors to invest in carbon capture technologies.⁵

The 45Q tax credit—the principal incentive available for CCS—is insufficient because the credit amount may equal between \$17 million to \$34 million in benefits for CCS facilities, yet the upfront investment of building an onshore CCS facility may cost upwards of \$240 million alone.⁶ The tax credit also has a major downside in which the Treasury forces the taxpayer to return any benefit received from the tax credit if carbon dioxide (CO₂) leaks from a facility.⁷

Additionally, considering the current role Texas plays in the energy industry, the state is well-equipped to implement legislation to support the growth and implementation of energy sustainability.⁸ Carbon capture is a

1. Press Release, U.S. Dep't of Just. Off. of Pub. Affs., *Justice Department and EPA Announce \$241.5M Settlement with Marathon Oil to Reduce Climate- and Health-Harming Emission in North Dakota*, U.S. DEP'T. OF JUST. (July 11, 2024) (on file with author).

2. *Id.*

3. See *infra* text accompanying notes 108–13 (discussing the total costs of investing in a CCS facility).

4. EPA OFF. OF CIV. ENF'T, *EPA Enforcement Targets Flaring Efficiency Violations*, 10 ENF'T ALERT 5, at 4 (2012), <https://www.epa.gov/sites/default/files/documents/flaringviolations.pdf>.

5. See Nichole Saunders, *As Texas Fails to Stop Flaring, EPA Must Act*, ENV'T DEF. FUND (Sept. 15, 2021), <https://blogs.edf.org/energyexchange/2021/09/15/as-texas-fails-to-stop-flaring-epa-must-act/>; Martha Pskowski, *Texas Continues to Issue Thousands of Flaring Permits*, INSIDE CLIMATE NEWS (Oct. 18, 2023), <https://insideclimatenews.org/news/18102023/texas-railroad-commission-approval-flaring/>.

6. See ANGELA C. JONES & DONALD J. MARPLES, CONG. RSCH. SERV., IF11455, *THE SECTION 45Q TAX CREDIT FOR CARBON SEQUESTRATION 2* (2023).

7. *Id.*

8. State Rep. Drew Darby, *Opinion: Texas Needs an All-of-the-Above Approach to Energy*, AUSTIN AMERICAN-STATESMAN (June 15, 2022, 5:58am), <https://www.statesman.com/story/opinion/2022/06/15/opinion-texas-needs-all-above-approach-energy/7603531001/>. Sustainable energy refers to energy sources that fulfill current energy demands without compromising future generations. *Renewable Energy vs Sustainable Energy: What's the Difference?*, JOHNS HOPKINS: SCH. OF ADVANCED INT'L STUD. (July 2, 2021), <https://energy.sais.jhu.edu/articles/renewable-energy-vs-sustainable-energy/>.

major component in achieving this energy sustainability, which is being highly sought after.⁹

The current Texas laws governing the liability of operators disincentivize oil and gas companies from being operators of CCS facilities.¹⁰ This is evident when considering the costs and liabilities of CCS facilities and the penalties associated with flaring.¹¹ To expand, the costs of CCS facilities are enormous, proving to be an inadequate way to incentivize operators to engage in CCS facilities, which are supported by public policy to reduce greenhouse gas (GHG) emissions.¹² Long-term liability for operators is also an important consideration for why operators would avoid investing in CCS facilities.¹³ This type of liability may arise from events that occur during the operational period, in which operators are transporting and injecting the carbon, or post injection after the closure of the facility.¹⁴

Moreover, although flaring penalties remain high, these penalties are rarely enforced by the RRC, failing to operate as a negative consequence.¹⁵ This lack of enforcement leads to increased flaring, which contributes to the issue that CCS facilities are designed to address—reducing air pollutants that contribute to climate change.¹⁶

Thus, Texas should adopt legislation that shifts liability from an operator of a CCS facility onto the state.¹⁷ This legislation would balance out the costs and liabilities related to onshore facilities, encourage investment in CCS facilities, and aid in achieving the federal objective of a net-zero economy.¹⁸

This Comment addresses the issue of how the existing incentives available to operators of CCS facilities in Texas are insufficient to encourage adequate investment in carbon capture technology to combat emissions that result from flaring. Part II provides a background in the current state of laws governing CCS operations, providing an overview of the process, challenges,

9. Darby, *supra* note 8.

10. *See infra* Section III.B.2 (explaining how the current Texas laws fail to encourage potential operators).

11. *See infra* Section III.B.1 (discussing the effects of the costs and liabilities associated with CCS facilities).

12. *See* Seyed Kourosh Mahjour & Salah A. Faroughi, *Risks and Uncertainties in Carbon Capture, Transport, and Storage Projects: A Comprehensive Review*, 119 *GAS SCI. & ENG'G* 1, 3–5 (2023), <https://www.sciencedirect.com/science/article/pii/S2949908923002455?via%3Dihub>.

13. *See infra* text accompanying notes 209–10, 216–17 (recognizing that long-term liability is a significant factor that potential investors of CCS facilities will consider).

14. *See infra* text accompanying notes 209–17 (noting that there is uncertainty regarding the cost of long-term liability for CCS facilities).

15. *See* Saunders, *supra* note 5; Pskowski, *supra* note 5.

16. *See* Saunders, *supra* note 5; Pskowski, *supra* note 5; Mahjour & Faroughi, *supra* note 12, at 3.

17. *See infra* Section III.A (explaining and providing the proposed liability-shifting legislation that Texas should adopt).

18. *See infra* Section III.B.3 (discussing how the proposed legislation would alleviate the costs and liabilities that potential operators are currently subject to and support the reduction of carbon emissions).

incentives, penalties, and liabilities of operators for CCS facilities.¹⁹ Part III presents proposed legislation for the Texas Legislature that shifts long-term liability for CCS facilities to the state and offers reasoning for why the enactment of the proposed legislation would be beneficial for attracting investment in carbon storage.²⁰ Part IV analyzes other aspects that are directly correlated to carbon storage, such as primacy and ownership of the pore space, that are essential to formulating a clear legislative framework.²¹

II. CURRENT STATE OF CARBON CAPTURE AND STORAGE OPERATIONS

Carbon capture is essential to achieving a net-zero economy to support sustainable energy practices.²² However, this goal is unattainable without sufficient incentives for operators.²³ Some state legislatures have tackled this issue by enacting liability-shifting statutes to encourage CCS.²⁴ States assuming liability of CCS facilities after operators complete specific criteria is necessary to promote carbon storage because the current financial incentives available to operators are insufficient for most operators who lack the required capital.

A. Carbon Capture Process

The carbon capture process is comprised of three steps: capture, transportation, and storage.²⁵ The process is an initiative to reduce the presence of CO₂ in the atmosphere in an effort to reduce climate change.²⁶ Storage, the last step of carbon sequestration, entails geological sequestration in which CO₂ is injected into underground geological formations to be permanently stored or later used for processes such as enhanced oil recovery (EOR).²⁷ EOR is a “method of oil extraction that uses CO₂ and water to drive

19. See *infra* Part II (providing background on the CCS process and the related challenges, incentives, penalties, and liabilities that storage operators for CCS facilities may encounter).

20. See *infra* Part III (discussing why the Texas Legislature should enact the proposed legislation that shifts long-term liability for CCS facilities to the state).

21. See *infra* Part IV (analyzing other aspects like primacy and pore space ownership that are important to establish a clear legislative framework governing carbon storage).

22. Cynthia L. Taylor & James W. Coleman, *Carbon Capture and Storage: The Key to a Net-Zero Economy*, MINN. LEGAL STUD. RSCH. PAPER, Oct. 10, 2024, at 3.

23. Cf. U.S. GOV'T ACCOUNTABILITY OFF., GAO-22-105274, DECARBONIZATION: STATUS, CHALLENGES, AND POLICY OPTIONS FOR CARBON CAPTURE, UTILIZATION, AND STORAGE 45 (2022) [hereinafter DECARBONIZATION] (explaining possible economic incentives for carbon capture).

24. TEXANS FOR LAWSUIT REFORM FOUND., LIABILITY PROTECTION FOR CARBON DIOXIDE SEQUESTRATION IN TEXAS, 20 (2022) https://www.tlrfoundation.org/wp-content/uploads/2024/08/Liability_Protection_for_Carbon_Dioxide_Sequestration_in_Texas.pdf [hereinafter LIABILITY PROTECTION].

25. JONES & MARPLES, *supra* note 6; see Vincent Gonzales et al., *Carbon Capture and Storage 101*, RES. FOR THE FUTURE 1, 2 (2020), https://media.rff.org/documents/CCS_101.pdf.

26. *What Is Carbon Sequestration?*, U.S. GEOLOGICAL SURV., <https://www.usgs.gov/faqs/what-carbon-sequestration> (last visited Mar. 31, 2025).

27. *Id.*

oil up [a] well, improving oil recovery and sequestering the CO₂ underground.²⁸ Before geologic sequestration, CO₂ is captured and pressurized until becoming liquid.²⁹ The captured CO₂ is then transported to a storage site by pipelines, ships, or other vehicles.³⁰ However, the preferred method of transportation for large amounts of CO₂ is pipelines.³¹ The storage sites used to store CO₂ are typically geological formations such as deep saline formations, coal beds, and former oil and gas reservoirs.³²

In Texas, former oil and gas reservoirs are the most suitable and prevalent site option available to operators.³³ The emptied underground geological formation that serves as a storage facility is known as the pore space.³⁴

For each geological formation, the storage of CO₂ is performed by injecting the fluid into porous rock formations.³⁵ These formations exist in onshore and offshore sedimentary basins that are naturally occurring depressions filled with sediments in the Earth's crust.³⁶ The technology used to inject CO₂ into these geological formations is similar to those used for oil and gas operations and is known as a Class VI well.³⁷ Class VI wells are underground injection wells that are "used to place fluid underground into porous geological formations."³⁸ When injected into the formation, CO₂ is trapped by a combination of physical and geochemical processes.³⁹ Physical trapping ensues when a layer of the formation prevents the stored CO₂ from migrating any further while geochemical trapping is when a chemical

28. Gonzales et al., *supra* note 25, at 1.

29. *Id.* at 2.

30. *Id.*

31. JUAN CARLOS ABANADES ET AL., IPCC SPECIAL REPORT ON CARBON DIOXIDE CAPTURE AND STORAGE 5 (Bert Metz et al. eds., 2005).

32. Gonzales et al., *supra* note 25.

33. *See id.*

34. *Understanding Pore Space Law in Oil and Gas Litigation*, BURFORD PERRY, <https://www.burfordperry.com/news-and-insights/understanding-pore-space-law-in-oil-and-gas-litigation#:~:text=Pore%20space%20refers%20to%20emptied,types%20of%20gases%20or%20minerals> (last visited Mar. 31, 2025).

35. ABANADES ET AL, *supra* note 31, at 31.

36. *Id.*

37. *Id.*; *Class VI – Wells Used for Geologic Sequestration of Carbon Dioxide*, EPA, <https://www.epa.gov/uic/class-vi-wells-used-geologic-sequestration-carbon-dioxide#ClassVIWell> (last updated Mar. 28, 2025).

38. *General Information About Injection Wells*, EPA, <https://www.epa.gov/uic/general-information-about-injection-wells> (last updated July 10, 2024). A well is "[a] bored, drilled, or driven shaft whose depth is greater than the largest surface dimension; or, a dug hole whose depth is greater than the largest surface dimension; or, an improved sinkhole; or, a subsurface fluid distribution system." 40 C.F.R. § 144.3 (2025).

39. Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO₂) Geologic Sequestration (GS) Wells, 75 Fed. Reg. 77230, 77231–32 (Jan. 10, 2011) (codified at 40 C.F.R. pts. 124, 144–47) [hereinafter Requirements Under the UIC Program].

reaction occurs between the minerals found in the formation and the injected carbon, causing the stored CO₂ to solidify.⁴⁰

Monitoring a well during the injection of CO₂ and post injection is essential to serve a variety of purposes.⁴¹ Notably, monitoring entails documenting “the condition of the injection well and measuring injection rates, wellhead and formation pressures.”⁴² Gathering this information aids in the detection of possible issues that may arise during the injection period by comparing baseline data compiled before operations began to data collected during the injection of CO₂.⁴³ Regarding an injection well’s integrity, the usage of cement bond logs aids in assessing the bond and stability of the cement surrounding a well’s casing.⁴⁴ This technology assists in identifying any deterioration in the well’s cement or chemical reactions.⁴⁵ Other technologies that monitor groundwater contamination, air quality, and the health of subsurface ecosystems also exist to identify issues that occur post injection.⁴⁶

B. Current Laws Governing Liability of Carbon Capture and Storage Facilities

Although the use of carbon is not a new development, the regulatory framework governing carbon injection wells was introduced recently.⁴⁷ The improvement of CCS technology and push for energy sustainability prompted this change.⁴⁸ Therefore, there are currently a significant number of regulations and laws governing the implementation, operation, and liability of CCS facilities.⁴⁹ This Section seeks to highlight the current agencies governing stored carbon facilities and the stored carbon itself, the present Texas laws overseeing carbon capture, and statutes of other jurisdictions that shift long-term liability for a carbon storage facility and stored carbon to the state or governing body.

40. *Id.*

41. ABANADES ET AL., *supra* note 31, at 234.

42. *Id.*

43. *See id.* at 235.

44. *Id.* at 239.

45. *Id.*

46. *Id.* at 239–40.

47. *See* 40 C.F.R. § 146.81–95 (2010).

48. *See Carbon Capture, Utilization, and Storage*, ARAMCO, https://www.aramco.com/en/what-we-do/energy-innovation/advancing-energy-solutions/carbon-capture-utilization-and-storage?utm_source=&utm_medium=&utm_campaign=&utm_term=&utm_content=&gad_source=1&gclid=Cj0KCQiArby5BhCDARIsAIJvjIRGQmqW8LKLwUCPbbPIoPY5HWq60dEwVOTpg-NZ6ICO1a7CtspfT8oaAkh9EALw_wcB (last visited Mar. 31, 2025).

49. *See infra* Section II.B (discussing the existing laws that are applicable to important aspects of CCS facilities).

The EPA is the federal regulatory agency responsible for the regulation of injection wells.⁵⁰ The Safe Drinking Water Act (SDWA) granted the EPA this power in 1974 and required the agency to report information to Congress on waste disposal practices and to cultivate federal requirements governing injection practices to “protect public health and prevent contamination of underground sources of drinking water”⁵¹ The EPA used this grant of authority to create the Underground Injection Control (UIC) program to regulate injection wells in accordance with the SDWA.⁵² According to the UIC program, injection wells must be authorized by permits granted by the EPA.⁵³ Thus, operators seeking to engage in the geological sequestration of carbon must obtain a permit from the EPA to be granted the authority to operate a Class VI well.⁵⁴

In 2008, the EPA proposed to amend the UIC program by adding Class VI wells as a new classification for the purpose of geological sequestration.⁵⁵ The proposed rulemaking was finalized in 2010, defining “geologic sequestration” as “the long-term containment of a gaseous, liquid, or supercritical carbon dioxide stream in subsurface geologic formations. . . . [N]ot apply[ing] to [CO₂] capture or transport.”⁵⁶ The final rule recognized geological sequestration as an option to reduce CO₂ in hopes of mitigating climate change.⁵⁷

The Class VI rule also includes criteria for well plugging and post injection site care (PISC) to protect underground sources of drinking water.⁵⁸ These provisions require operators to “properly plug the injection well[s], monitor the site[s] for a timeframe established in the permit . . . demonstrate to the UIC Program Director that USDWs are not being endangered, and complete the plugging of monitoring wells to enable site closure.”⁵⁹ PISC monitoring is important because although a majority of the injected carbon should remain, some stored carbon migrates, leading to the potential contamination of USDWs.⁶⁰

50. *General Information About Injection Wells*, *supra* note 38.

51. *Id.*

52. Philip M. Marston & Patricia A. Moore, *From EOR to CCS: The Evolving Legal and Regulatory Framework for Carbon Capture and Storage*, 29 ENERGY L.J. 421, 466 (2008).

53. *General Information About Injection Wells*, *supra* note 38.

54. Philip K. Lau, *Carbon Capture, Utilization, and Storage: Class VI Wells and US State Primacy*, MAYER BROWN (June 9, 2022), <https://www.mayerbrown.com/en/insights/publications/2022/06/carbon-capture-utilization-and-storage-class-vi-wells-and-us-state-primacy>.

55. Marston & Moore, *supra* note 52, at 468.

56. Requirements Under the UIC Program, *supra* note 39, at 77287.

57. *Id.*

58. EPA OFF. OF WATER, GEOLOGICAL SEQUESTRATION OF CARBON DIOXIDE: UNDERGROUND INJECTION CONTROL (UIC) PROGRAM CLASS VI WELL PLUGGING, POST-INJECTION SITE CARE, AND SITE CLOSURE GUIDANCE, ii (2016) [hereinafter UIC PROGRAM CLASS VI WELL GUIDANCE]; *see* 40 C.F.R. § 146.92–93 (2025).

59. UIC PROGRAM CLASS VI WELL GUIDANCE, *supra* note 58.

60. *Id.* at 39.

Under the SDWA, the EPA may grant states primacy over injection wells.⁶¹ Primacy shifts regulatory responsibility, allocating primary responsibility onto the states to implement rules promulgated by the EPA.⁶² To be granted primacy, a state must complete a formal application.⁶³ One component of the application is that each state must promulgate its own regulations governing Class VI wells.⁶⁴ Although state regulations usually resemble federal regulations, some modifications are allowable especially in the area of ownership and liability after site closure.⁶⁵ If a state receives primacy, the state must assign a state regulatory agency to oversee any Class VI wells.⁶⁶ Texas's application for primacy proposes that the RRC and the Texas Commission on Environmental Quality (TCEQ) will be the primary authorities over Class VI wells.⁶⁷ The Oil and Gas Division of the RRC will administer the state's Class VI UIC Program.⁶⁸

However, primacy is not necessary, and many state legislatures have enacted legislation that promotes CCS without the state also having primacy.⁶⁹ For states that have crafted frameworks regulating CCS facilities, some have a process by which the state assumes liability if certain criteria is met in the time period provided by a state's legislation.⁷⁰ Currently, the Texas Clean Air Act provides that after the closure of a CO₂ storage site, the state takes title to the stored carbon; however, the storage operator retains liability.⁷¹ Thus, the statute fails to offer any liability protection to the operator.⁷²

C. Other Jurisdictions with Liability-Shifting Statutes

Incorporating liability-shifting statutes to encourage CCS is a recent trend among legislatures that have implemented statutory frameworks governing carbon sequestration.⁷³ Wyoming, Montana, Louisiana, North Dakota, Indiana, Nebraska, and Alberta have all enacted a statute through which the state assumes liability after the cessation of the injection period.⁷⁴

61. Marston & Moore, *supra* note 52, at 467.

62. *Id.*

63. Anthony J. Carna et al., *EPA, States Differ on Approach to Carbon Capture and Storage Facility Liability*, MCGUIREWOODS (July 26, 2024), https://www.mcguirewoods.com/client-resources/alerts/2024/7/epa-states-differ-on-approach-to-carbon-capture-and-storage-facility-liability/?pdf&post_id=74287.

64. *Id.*

65. *Id.*

66. *Id.*

67. RRC, CLASS VI UNDERGROUND INJECTION CONTROL PROGRAM DESCRIPTION DRAFT 1 (2022).

68. *Id.* at 1–2.

69. LIABILITY PROTECTION, *supra* note 24, at 6.

70. *Id.*

71. TEX. HEALTH & SAFETY CODE ANN. § 382.507–08.

72. *See* LIABILITY PROTECTION, *supra* note 24.

73. *Id.* at 6.

74. *Id.*; *see infra* text accompanying notes 75–85 (noting each state or province's statute that shifts long-term liability for carbon storage facilities during the post closure period).

However, the operator is not easily relieved of liability and usually must meet extensive requirements to be awarded a certificate of completion from the jurisdiction in which the carbon storage facility is located.⁷⁵ Another element present in each of the statutes is a trust fund created for the purpose of funding the long-term management and monitoring of the storage facilities once the state retains ownership and liability.⁷⁶

The Wyoming legislature established a framework in which the state assumes title of and liability for the captured carbon and storage facility after a twenty-year monitoring period—a period that begins once carbon injections cease.⁷⁷ The issuance of a certificate of completion is contingent upon an injector (1) fully complying with the governing laws of carbon storage; (2) addressing pending claims related to the stored carbon; (3) expecting the injected carbon to pose no threat to human or environmental health and safety; (4) believing the stored carbon is unlikely to impede any neighboring underground or pore space; (5) ensuring all components of the facility are in good condition; (6) plugging all injection wells; and (7) completing all required reclamation.⁷⁸ Once the certificate is issued, the Wyoming Geologic Sequestration Special Revenue Account—i.e., the state’s statutorily-created trust fund—pays out any damages that arise from a storage facility under the state’s responsibility, provided those damages do not exceed the account’s balance.⁷⁹

Montana’s statute differs in that an operator must meet certain criteria for twenty-five years before being issued a certificate of completion.⁸⁰ After an additional monitoring period of twenty-five years, the state finally assumes liability for the storage facility and stored carbon.⁸¹ During the monitoring period, the storage operator maintains liability, continuing to provide adequate bond or other surety, and must comply with conditions laid out in the Montana Code for the state to eventually assume liability.⁸²

However, the state’s Board of Oil and Gas Conservation may elect to allow compliance with the requirements for a period of less than fifty years, given that the operator accepts liability for at least thirty years before shifting liability to the state.⁸³ The state also requires the operator to pay a fee on each ton of carbon injected into a storage facility to fund the state’s assumption of long-term liability for the carbon storage facilities.⁸⁴

75. LIABILITY PROTECTION, *supra* note 24, at 6.

76. *Id.*

77. WYO. STAT. ANN. § 35-11-319(b) (2024).

78. *Id.* § 35-11-319(c).

79. *Id.* § 35-11-319(d)(iii).

80. MONT. CODE ANN. § 82-11-183 (2023).

81. *Id.*

82. *Id.* § 82-11-183(4).

83. *Id.* § 82-11-183(11).

84. *Id.* § 82-11-181.

Similarly, Louisiana implements a monitoring period of fifty years before a certificate of completion may be issued to the operator, and ownership of the stored carbon transfers to the state.⁸⁵ Previously, Louisiana only required a monitoring period of ten years.⁸⁶ This extensive monitoring period is a new addition to the state's regulatory framework and was modified as part of an effort to comport with the EPA's rigorous regulations.⁸⁷

In addition, liability still falls upon the storage operator if Louisiana's trust fund is depleted of funds or if the storage operator intentionally and knowingly hides or misrepresents material facts about the integrity of the storage facility.⁸⁸ Although damages that may be paid using the trust fund for actions brought against a storage operator are capped,⁸⁹ the trust fund should remain useable by operators because of the many sources of income that support it.⁹⁰

North Dakota's statute has a slightly shorter monitoring period of ten years before an operator's issuance of a certification of project completion.⁹¹ One notable difference in North Dakota's statute is that storage operators must pay two fees.⁹² Each fee is based on each ton of carbon injected into the storage facilities and is allocated towards administrative costs and the expenses of long-term management and monitoring.⁹³

Indiana differs from the previously mentioned states because, once a certificate of project completion is issued, the state assumes ownership and any potential liability of the storage facility with no monitoring period.⁹⁴ Additionally, the state possesses a trust fund that is funded by operators paying a fee of eight cents per ton of CO₂ injected into the storage facility.⁹⁵

The Indiana Code also contains unique provisions that address liability before the state assumes ownership of a storage facility.⁹⁶ First, it permits a public utility to seek damages from harm that CCS operations may cause to the public water supply.⁹⁷ Second, it prevents a claimant asserting subsurface

85. LA. STAT. ANN. § 30:1109(A)(1) (2024).

86. Nikki Buffa et al., *EPA Grants Louisiana Class VI Primacy*, LATHAM & WATKINS (Feb. 5, 2024), <https://www.globalelr.com/2024/02/epa-grants-louisiana-class-vi-primacy/#:~:text=To%20ensure%20consistency%20with%20EPA's,decades%20after%20a%20project's%20completion.>

87. *Id.*

88. LA. STAT. ANN. § 30:1109(A)(3) (2024).

89. *Id.* § 30:1109(B)(1) (stating that civil actions against storage operators are capped at \$250,000 in damages while actions for noneconomic loss are capped at \$500,000 in damages).

90. *Id.* § 30:1110(B)(1)–(6) (listing that the CO₂ Geologic Storage Trust Fund may be funded through (1) fees, penalties, and bond forfeitures collected from the state's environmental laws; (2) private contributions; (3) interest earned on funds deposited in the fund; (4) civil penalties; (5) grants, donations, and sums; and (6) site-specific trust accounts).

91. N.D. CENT. CODE § 38-22-17(1)–(5) (2025).

92. *Id.* § 38-22-14 to -15

93. *Id.*

94. IND. CODE § 14-39-2-13(d) (2024).

95. *Id.* § 14-39-2-9.

96. *Id.* § 14-39-2-12(a)–(b).

97. *Id.* § 14-39-2-12(a).

trespass from bringing an action, unless the claimant shows that the injection or migration of carbon is (1) harmful to one's health or interferes with one's enjoyment of life or property, or (2) the cause of a "direct physical injury to a person, an animal, or tangible property."⁹⁸ Further, the law places limits on what damages a surface or subsurface interest holder may recover.⁹⁹

Like Indiana, Nebraska assumes liability and title to the storage facility and carbon once a certificate of completion is issued with no specified monitoring period.¹⁰⁰ The state then retains responsibility for monitoring and managing the storage facility, which is simultaneously monitored by the Nebraska Oil and Gas Conservation Commission.¹⁰¹ Moreover, similar to North Dakota, storage operators must pay two fees that fund the Storage Facility Administrative Fund.¹⁰²

Similarly, Canadian provinces also provide an example for how operator liability and obligations are treated for purposes of carbon storage and sequestration.¹⁰³ Under the Mines and Minerals Act, "[t]he Government of Alberta assumes long-term liability and obligations [involving] wells, facilities[,] or sequestered CO₂ for [carbon storage] projects" after a closure certificate is issued with no monitoring period.¹⁰⁴ The Alberta Energy Regulator only issues a closure certificate after the completion of the condition that the operator has met criteria resembling those implemented by previously mentioned states. A special feature of the Alberta statute is that the government "provides an indemnity for the owner, licensee, person responsible and operator of the site, for damages in a tort action"¹⁰⁵

D. The Challenges and Incentives of CCS Facilities

The future of CCS relies on the financial incentives available to operators and whether the associated risks may be overcome.¹⁰⁶ This is because without appropriate incentives, investment in CCS facilities will be economically unviable to most potential operators.¹⁰⁷

98. *Id.* § 14-39-2-12(b)(2).

99. *Id.* § 14-39-2-12(c)–(d).

100. NEB. REV. STAT. § 57-1619(5)(a)–(d) (2024).

101. *Id.* § 57-1619(5)(e).

102. *Id.* §§ 57-1616(1) to -1617(1).

103. Randy Brunet & Nicole Graham, *Who Is Responsible? Long-Term Liability for Carbon Storage Projects*, MLT AIKINS (Feb. 20, 2024), <https://www.mltaikins.com/energy/who-is-responsible-long-term-liability-for-carbon-storage-projects/>; *Carbon Capture, Utilization and Storage – Leadership*, GOV'T OF ALTA., <https://www.alberta.ca/carbon-capture-utilization-and-storage-leadership#:~:text=Mines%20and%20Minerals%20Act%2C%20as,the%20Post%2DClosure%20Stewardship%20Fund> (last visited Mar. 31, 2025).

104. Brunet & Graham, *supra* note 103; *Carbon Capture, Utilization and Storage – Leadership*, *supra* note 103.

105. Brunet & Graham, *supra* note 103.

106. ABANADES ET AL., *supra* note 31, at ii, 341–42.

107. *See id.*

The largest challenge operators face is the cost of capturing CO₂.¹⁰⁸ The capture costs include the transport of carbon, upfront capital requirements, and operating and maintenance expenses.¹⁰⁹ Regarding storage site costs, there is a substantial range depending on location, reservoir depth, and permeability and viscosity of the storage formation.¹¹⁰ However, the equipment and energy required for capture and compression are generally the most expensive costs.¹¹¹

Moreover, because carbon capture operations are in early stages of development, financial returns are subject to more risk compared to other operations in the energy industry.¹¹² As a result, the cost of capital to fund CCS projects is higher in comparison.¹¹³

The challenge of transporting CO₂ also exists.¹¹⁴ Not only are the specialized pipelines costly, but transportation also requires substantial energy to pressurize the CO₂.¹¹⁵ Additionally, dangerous leaks and potential explosions may occur if foreign substances contaminate the CO₂ stream and damage pipelines.¹¹⁶

Further, lack of public support may hinder CCS operations, which is becoming progressively more acknowledged as an important component to the execution of widespread CCS operations.¹¹⁷ Without public support, surface owners may be unwilling to lease their pore space, and private investment may be discouraged.¹¹⁸ Thus, negative opinions regarding carbon storage operations could affect site selection and gathering support from investors.¹¹⁹

The Section 45Q tax credit is the most advantageous incentive currently available to storage operators.¹²⁰ The purpose of the tax credit is to encourage investment in carbon capture and sequestration and was first introduced by Congress through the Energy Improvement and Extension Act of 2008.¹²¹

The amount of credit a taxpayer receives is dependent on the use of the CO₂ and when the equipment is placed into service.¹²² There are also annual capture requirements depending, again, on the date equipment is placed in

108. *Id.* at 354.

109. *Id.* at 354, 356.

110. *Id.* at 357.

111. Gonzales et al., *supra* note 25.

112. *Id.* at 3.

113. *Id.*

114. *Id.*

115. *Id.*

116. *Id.*

117. *Id.*

118. *See generally id.* (discussing potential consequences of a lack of public support).

119. *See id.*

120. *See JONES & MARPLES, supra* note 6.

121. *Id.* at 1.

122. *Id.* at 2, Table I.

service and on the type of storage facility used.¹²³ For an entity to be eligible to claim the tax credit, it must own “the capture equipment and physically or contractually ensure[] the disposal, utilization, or use as a tertiary injectant of the CO₂.”¹²⁴

E. Potential Liabilities Associated with Carbon Storage Facilities

Liability for CCS operators falls into two categories: (1) the risks associated with the capture, transport, and injection processes, and (2) the potential issues associated with the stored CO₂ after injection.¹²⁵ The former category is operational liability, which includes induced seismic activity, while the latter deals with liability that occurs post injection, such as loss of fair market value of the pore space and the potential leakage of stored carbon.¹²⁶

One form of operational liability is induced seismic activity, which may lead to liability for damages that are directly correlated to injection of CO₂.¹²⁷ Induced seismicity occurs when the injection of CO₂ alters the stress field of the pore space, releasing energy stored in the formation that triggers a seismic reaction.¹²⁸

Similar to Class VI wells, wastewater disposal wells involve subsurface injection.¹²⁹ Recently, a significant increase in the amount of injected wastewater was linked to a noticeable increase in recorded earthquakes.¹³⁰ For example, in Oklahoma, this seismic activity seems to be prompted by the high number of disposal wells, which could be a similar issue for CCS facilities.¹³¹ However, another contributing factor to induced seismicity is the stress conditions of the formation where the carbon is stored.¹³² This directly supports the importance of testing to assess the integrity of proposed sites.¹³³

Subsurface leaks result in liability that occurs post injection.¹³⁴ In Texas, permanently stored CO₂ is currently the property of the storage operator; thus, if the stored CO₂ migrated into a pore space in which the operator failed to obtain rights, the operator would likely be subject to liability for a

123. *Id.* (listing power plants, direct air capture (DAC) facilities, and other capture facilities with differing requirements, depending on the classification of the facility).

124. *Id.*

125. MARK DE FIGUEIREDO ET AL., THE LIABILITY OF CARBON DIOXIDE STORAGE 1, https://sequestration.mit.edu/pdf/GHGT8_deFigueiredo.pdf (last visited Mar. 31, 2025).

126. *See id.*

127. LIABILITY PROTECTION, *supra* note 24, at 19.

128. *Id.*

129. James P. Verdon & Anna L. Stork, *Carbon Capture and Storage, Geomechanics and Induced Seismic Activity*, 8 J. ROCK MECHS. & GEOTECHNICAL ENG'G 928, 929 (2016).

130. *Id.* at 928–29.

131. *Id.* at 930.

132. *Id.*

133. *Id.*

134. FIGUEIREDO ET AL., *supra* note 125.

subsurface trespass or conversion.¹³⁵ This type of liability arises because the presence of CO₂ in one's pore space prevents other uses of the pore space including "oil and gas extraction, natural gas storage, and waste disposal."¹³⁶ Therefore, the owner of the pore space may seek damages if subsurface trespassing or conversion occurs from the presence of injected CO₂.¹³⁷

Although subsurface trespass laws remain unclear, in *Humble Oil & Refining Co. v. West* the Supreme Court of Texas held a surface owner possesses "the right to inject and store [non-native] gas in the [formation]."¹³⁸ Following a similar principle, the Court in *Lightning Oil Co. v. Anadarko E&P Onshore* reasoned that while the rights from a mineral lease give the lessee the right to exercise control over the minerals subject to the lease, the right to possess the space where the minerals are found is not included.¹³⁹

Subsurface leaks can also contaminate nearby drinking water sources, conflicting with the purpose of the SDWA.¹⁴⁰ Under the SDWA, CO₂ is included in the definition of a contaminant.¹⁴¹ Studies have shown that the release of CO₂ into drinking water sources could cause "measurable alteration in pH, major ions, and mobilization of hazardous inorganics."¹⁴²

III. TEXAS SHOULD ADOPT LEGISLATION SHIFTING LIABILITY AWAY FROM OPERATORS OF CCS FACILITIES TO THE STATE TO DISCOURAGE FLARING AND ENCOURAGE INVESTMENT IN CARBON STORAGE

The government is pushing for cleaner energy practices through methods such as CCS facilities.¹⁴³ While some states have shifted liability from the operator onto the state, Texas still differs and places all liability on the operator for claims arising out of incidents and damages occurring from carbon storage facilities.¹⁴⁴ The Texas Legislature should follow in the steps

135. LIABILITY PROTECTION, *supra* note 24, at 17.

136. *Id.* at 18.

137. *Id.*

138. *Humble Oil & Refin. Co. v. West*, 508 S.W.2d 812, 817 (Tex. 1974).

139. *Lightning Oil Co. v. Anadarko E&P Onshore*, 520 S.W.3d 39, 49 (Tex. 2017).

140. *See id.* at 51.

141. 42 U.S.C. § 300f(6).

142. EPA OFF. OF RSCH. & DEV., USE OF SOIL-GAS, GAS FLUX, AND GROUND-WATER MONITORING TO EVALUATE POTENTIAL LEAKAGE TO UNDERGROUND SOURCES OF DRINKING WATER, THE ATMOSPHERE, AND BUILDINGS DURING GEOLOGICAL SEQUESTRATION OF CARBON DIOXIDE (2009) <https://nepis.epa.gov/Exe/ZyNET.exe/P1006LI5.TXT?ZyActionD=ZyDocument&Client=EPA&Index=2006+Thru+2010&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&To cEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&X mlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C06thru10%5Ctxt%5C00000015%5CP100 6LI5.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments =1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x& SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntr y=1&SeekPage=x&ZyPURL>.

143. *See* NATHAN MUSICK, CONG. BUDGET OFF., CARBON CAPTURE AND STORAGE IN THE UNITED STATES 6 (Christian Howlett ed., 2023).

144. TEX. HEALTH & SAFETY CODE ANN. § 382.508(a).

of other states' legislatures, such as Wyoming, North Dakota, and Montana, and adopt legislation shifting liability to encourage the development of CCS facilities.¹⁴⁵

A. Proposed Legislation to Shift Liability of Operators Completely to the State of Texas

Texas should adopt model legislation similar to the proposal below that shifts complete liability from an operator to the state. The proposed legislation contains eight sections, most importantly addressing certain definitions, the process of liability transition, a certificate of completion, funding, and an operator negligence standard.¹⁴⁶

This legislation is comparable to the long-term liability statutes enacted by Wyoming, North Dakota, and Montana because a monitoring period is implemented before liability is transferred.¹⁴⁷ However, the legislation's monitoring period is most similar to Wyoming because it implements a twenty-year monitoring period before the state assumes all legal liability and responsibility for the CCS facility, which is identical to Wyoming's statute.¹⁴⁸ A monitoring period of twenty years is ideal because a period of ten years, like in North Dakota, is too short of a time frame to adequately discover potential operator negligence while a period of fifty years, like in Louisiana, is unreasonably long.¹⁴⁹

One notable definition in the proposed legislation defines what is "commercially reasonable." This is important because if an operator fails to act commercially reasonable, the RRC may elect to not issue a certificate of completion, which is described fully in § 6, titled "Operator Negligence Standard."¹⁵⁰ Implementing this consequence directly addresses concerns that shifting long-term liability will result in operators acting carelessly.¹⁵¹

Although Wyoming, North Dakota, and Montana all impose fees on operators to fund any liability that may arise after the state has assumed liability, the proposed legislation models its fund after Montana's geological

145. See *supra* text accompanying notes 73–105 (describing the statutes enacted by other state legislatures that shift long-term liability to the state to promote investment in CCS facilities).

146. See *infra* text accompanying notes 146–53 (detailing important components to the statute that allow the shifting of long-term liability for onshore carbon capture facilities to Texas).

147. See WYO. STAT. § 35-11-319 (2024); N.D. CENT. CODE § 38-22-17 (2025); MONT. CODE ANN. § 82-11-183 (2023).

148. WYO. STAT. § 35-11-319(b) (2024).

149. LA. STAT. § 30:1109(A)(1) (2024); N.D. CENT. CODE § 38-22-17(1)–(5) (2025).

150. See *infra* note 160 and accompanying text (describing the consequences that may occur if an operator fails to act in a commercially reasonable manner and exhibits negligent behavior in the monitoring period).

151. See Scott Anderson, *States Should Not Weaken Liability Laws for CCS Projects*, ENV'T DEF. FUND (May 3, 2022), <https://blogs.edf.org/energyexchange/2022/05/03/states-should-not-weaken-liability-laws-for-ccs-projects/>.

storage reservoir program account.¹⁵² Parallel to Montana's account, the proposed fund for Texas includes a fee for operators to pay that is based on each ton of carbon injected in an onshore storage facility.¹⁵³ This fee will pay any expenses the state expects to incur while monitoring and managing the onshore storage facilities post closure.

Texas Liability Transition Act for Onshore Carbon Capture Facilities

Section 1: Title

This Act shall be known as the "Texas Liability Transition Act for Onshore Carbon Capture Facilities."

Section 2: Definitions

For purposes of this Act, the following definitions shall apply:

1. "**Carbon Capture Facility**" refers to any onshore facility designed for the capture, transportation, and geological sequestration of carbon dioxide.¹⁵⁴
2. "**Commercially reasonable**" means a condition that would allow a reasonably prudent operator to fully, effectively, and economically comply with the rules and regulations regarding the permitting, physical operation, closure, and post closure care of a geologic storage facility, as determined based on the objective standard of a reasonably prudent operator and not on an individualized assessment of an actual operator's capacity to act.¹⁵⁵
3. "**Injection Period**" refers to the period during which carbon dioxide is injected into a geological formation.¹⁵⁶
4. "**State Liability**" refers to when Texas assumes responsibility for any potential harm or damages arising out of the operation of carbon capture facilities after the monitoring period has ceased and a certificate of completion has been issued after meeting the required criteria.¹⁵⁷

152. MONT. CODE ANN. § 82-11-181 (2023).

153. *Id.*; see *infra* note 163 and accompanying text (explaining the fund that would be used by the state to pay for expenses the state would incur for accepting long-term responsibility of the facility after the issuance of a certificate of completion).

154. See generally WYO. STAT. § 37-18-101(a)(i) (2024) (giving a similar definition); N.D. CENT. CODE 38-22-02(7) (2025) (providing an example of a similar definition).

155. TEX. NAT. RES. CODE ANN. § 81.0523.

156. N.D. ADMIN. CODE 43-05-01-01(31) (2025).

157. See WYO. STAT. § 37-11-319(d) (2024); N.D. CENT. CODE § 38-22-17(6) (2025).

5. **“Operator”** means any person or other entity that has operational control over a carbon capture facility, including but not limited to the design, construction, management, and maintenance of the facility during its operational phase and any post injection monitoring, reporting, or closure activities that holds or applies for a permit.¹⁵⁸
6. **“Onshore Facility”** means any facility located on land within the State of Texas that is used for the purpose of capturing, processing, storing, or transporting carbon dioxide or other related substances, excluding any offshore facilities located in navigable waters.¹⁵⁹

Section 3: Liability Transition

- (a) Upon the cessation of the injection period, a twenty-year monitoring period shall commence. An operator of an onshore facility shall be relieved of liability for any damages or claims related to the stored carbon dioxide if the criteria for a certificate of completion is met after the monitoring period has been completed.¹⁶⁰
- (b) The operator shall assume all liability correlated with the injected carbon dioxide that has been stored into the geological formation for a period of twenty years following the cessation of the injection period.¹⁶¹

Section 4: Certificate of Completion¹⁶²

- (a) After the twenty-year monitoring period, the operator of the onshore facility may apply for a certificate of completion
- (b) The certificate of completion may be issued if the following criteria are met by the operator:
 1. the monitoring and reporting requirements established by the Texas Railroad Commission (RRC) have been fulfilled;
 2. the onshore facility has demonstrated that the injected carbon dioxide has remained securely contained within the geological formation; and

158. See N.D. CENT. CODE § 38-22-02(8) (2025); LA. STAT. § 30:1103(12) (2024).

159. 33 C.F.R. § 154.105 (2025).

160. WYO. STAT. § 35-11-319(b)–(c) (2024).

161. *Id.*

162. See *id.* § 35-11-319(d).

3. any identified possible risks to public health, the environment, or both have been evaluated and found to be acceptable by the RRC.
- (c) The issuance of the certificate of completion shall relieve the operator of any further obligations or liabilities associated with the onshore facility.
- (d) Once an operator has been relieved of liability pursuant to subsection (c), the state shall assume complete liability for the onshore facility.

Section 5: Funding and Administration¹⁶³

- (a) The state shall establish a fund to manage the liabilities associated with onshore facilities.
- (b) The fund shall be sourced from a fee imposed on operators during the operational period for the state to use for monitoring and managing the onshore facility.
- (c) The fee shall be based upon each ton of carbon dioxide injected for storage by the operator.
- (d) The amount of the fee shall be set by the RRC based on the anticipated actual expenses of monitoring and managing the onshore storage facility during the post closure phase.
- (e) The RRC shall be responsible for overseeing this fund and the administration of the certificate of completion.

Section 6: Operator Negligence Standard¹⁶⁴

- (a) If an operator is found negligent during the monitoring period, the RRC may choose not to issue a certificate of completion, and the operator will be responsible for any associated liability.
- (b) An operator is deemed negligent if an operator fails to act commercially reasonable which may include, but is not limited to, a failure to
 1. report incidents including unintentional carbon dioxide loss;
 2. investigate accidents, incidents, threats to public safety, and complaints related to operational safety;
 3. cooperate with the RRC's investigations; or
 4. provide the RRC with reasonable access to the operator's onshore facilities and any related records.

163. MONT. CODE ANN. § 82-11-181 (2023).

164. See generally TEX. NAT. RES. CODE ANN. § 81.0523 (providing a standard for commercially reasonable).

Section 7: Effective Date

This Act shall take effect immediately upon its passage and approval.

Section 8: Severability

If any provision of this Act is found to be unconstitutional or invalid, the remaining provisions shall continue in full force and effect.¹⁶⁵

B. The Legislation Should Be Adopted Because It Offsets Carbon Storage-Related Costs and Liabilities That Currently Outweigh Incentives and Encourage Flaring

Although respected scholars argue that CCS should be swiftly implemented by states, projects lack significant development because of insufficient incentives.¹⁶⁶ Moreover, an unclear regulatory framework and long-term liability placed on operators has the potential to hinder companies from joining the initiative to reduce GHGs and investing in CCS because of inadequate incentives.¹⁶⁷ Therefore, Texas adopting legislation similar to Wyoming, North Dakota, and Montana will address the current inadequacy of incentives available to potential CCS operators and the burden that long-term liability would place on CCS operators.

The proposed legislation would simultaneously address the frequency of flaring. Flaring is a method used by producers to rid of unwanted gas, which is often a by-product of oil extraction.¹⁶⁸ While the gas is mostly methane, the flaring process converts the gases into CO₂ that is then released into the atmosphere.¹⁶⁹ The CO₂ emitted by flared gas directly conflicts with the objective of reducing carbon emissions to combat climate change.¹⁷⁰

In theory, legislation providing more incentive for investment in carbon sequestration should decrease flaring. The RRC's current leniency for flaring in oil and gas operations encourages actions that lead to increased emissions,

165. See, e.g., Legal Information Institute, *Severability Clause*, CORNELL L. SCH., https://www.law.cornell.edu/wex/severability_clause (last reviewed June 2024) (demonstrating how a severability clause preserves remaining contract terms when one term is declared unconstitutional).

166. Michael Faure, *Liability and Compensation for Damage Resulting from CO₂ Storage Sites*, 40 WM. & MARY ENV'T L. & POL'Y REV. 387, 395–96 (2016).

167. *Id.* at 397 (discussing scholars Hawkins, Peridas, and Steelman's work that a "lacking regulatory framework and the potential for long-term liability could reduce incentives for investments in CCS").

168. Deborah Gordon et al., *Where Gas Flaring Is Endangering Communities*, RMI (Apr. 24, 2024), <https://rmi.org/where-gas-flaring-is-endangering-communities/#:~:text=Impacts%20to%20the%20environment%20and,disproportionately%20impacted%2C%20elevating%20EJ%20risks>.

169. *Id.*

170. *What Is Net Zero?*, NATIONAL GRID (Feb. 23, 2023), <https://www.nationalgrid.com/stories/energy-explained/what-is-net-zero#:~:text=We've%20all%20heard%20the,emission%20reduction%20and%20emission%20removal>.

defeating the federal government's goal of a net-zero economy.¹⁷¹ This legislation would balance out the costs and liabilities related to onshore facilities and encourage investment in CCS facilities rather than increased flaring.

1. Comparing Carbon-Related Costs and Liabilities to Incentives

The cost of carbon capture and storage currently outweighs the available incentives.¹⁷² Currently, the Section 45Q tax credit is the primary revenue stream available to operators of onshore facilities.¹⁷³ The amount of credit available to a taxpayer is based on the amount “per metric ton of qualified carbon oxide captured and sequestered,” the use of the stored carbon, and when the equipment is in service.¹⁷⁴ Moreover, if leakage occurs and the carbon dioxide seeps into the atmosphere, ceasing “to be captured, disposed of, or used in a qualifying manner,” the Treasury requires the taxpayer to repay the tax credit.¹⁷⁵

Additionally, the upfront investment of an onshore CCS facility, excluding the costs of transport and storage, ranges from \$15 to \$120 per metric ton of captured CO₂.¹⁷⁶ Putting the cost into perspective, a stand-alone carbon storage facility is projected to capture one to two million tons of carbon per year.¹⁷⁷ Therefore, projected costs could range from \$15 million to \$240 million.¹⁷⁸ However, the potential benefit a taxpayer receives is only \$17 per metric ton of captured CO₂, only allowing a taxpayer to receive a small portion of the total expenditures because the upfront costs of constructing a CCS facility alone amounts to \$17 million to \$34 million.¹⁷⁹

Moreover, although depleted oil and gas reservoirs in Texas may be suitable locations for carbon storage, the primary risk factor associated with storage facilities is the potential for leakage.¹⁸⁰ Leakages may occur from aquifer over-pressurization, abandoned wells, or faults and fractures.¹⁸¹

171. Pskowski, *supra* note 5.

172. Faure, *supra* note 166, at 396.

173. Taylor & Coleman, *supra* note 22, at 24; see JONES & MARPLES, *supra* note 6, at 1.

174. JONES & MARPLES, *supra* note 6, at 1–2 (explaining that under the tax credit, qualified carbon oxide is a carbon oxide captured by qualified equipment that otherwise would be released into the atmosphere).

175. *Id.* at 1.

176. See MUSICK, *supra* note 140, at 1.

177. *Understanding CCUS*, THE CCS HUB, <https://ccushub.ogci.com/ccus-basics/understanding-ccus/#:~:text=It%20sees%20carbon%20storage%20capacity,of%20carbon%20dioxide%20per%20year> (last visited Mar. 31, 2025).

178. *Id.*

179. *Id.*

180. Temitope Ajayi et al., *A Review of CO2 Storage in Geological Formations Emphasizing Modeling, Monitoring and Capacity Estimation Approaches*, 16 PETROLEUM SCI. 1028, 1052 (2019).

181. *Id.* at 1052–53.

Further, there is concern surrounding the contamination of drinking water aquifers.¹⁸² Not only can CO₂ leakages escape to the surface, but there is also the potential for CO₂ to migrate to groundwater.¹⁸³ Additionally, the pressure from CO₂ injection may drive brine—highly concentrated salt water—a distance of potentially tens of kilometers towards aquifers holding drinking water.¹⁸⁴ As a result, potential CO₂ leakages and migrating brine may cause “mobilization of toxic metals and increased salinity” in drinking water.¹⁸⁵

In addition, a landowner will likely be able to bring a claim against storage operators for surface damages and groundwater contamination as a result from a stored CO₂ leakage.¹⁸⁶ Currently, there is a lack of case law concerning a landowner bringing these specific claims; however, the ability of landowners to pursue such claims can be inferred from case law where the Supreme Court of Texas held that landowners possess the ability to pursue claims against oil companies for oilfield contamination.¹⁸⁷

For instance, in *Forest Oil Corp. v. El Rucio Land & Cattle Co.*, the landowner of the McAllen Ranch sued Forest Oil, alleging that oilfield wastes caused soil and groundwater contamination, including naturally occurring radioactive material (NORM).¹⁸⁸ Pursuant to a written agreement, the parties arbitrated all claims which resulted in a favorable award of \$15 million in actual damages for McAllen among other relief.¹⁸⁹ On appeal, Forest Oil contended the legislature intended for the RRC to possess sole jurisdiction over environmental oilfield claims.¹⁹⁰ However, the court disagreed, reasoning that the legislature failed to demonstrate an intent to replace a landowner’s common-law rights with a statutory remedy.¹⁹¹ Therefore, the court held a landowner is free to bring any common-law claims relating to contamination caused by operations on one’s land.¹⁹²

Similarly, a landowner who suffers surface damages or groundwater contamination from onshore CCS facilities will likely be able to bring a claim against storage operators.¹⁹³

Moreover, if CO₂ migrates from a storage facility and fills another’s pore space, a potential liability for operators is the pore space owner suing

182. *Id.*

183. Faure, *supra* note 166, at 398.

184. *Id.* at 398–99.

185. *Id.* at 399.

186. See Andrew Stakelum, *The Texas Supreme Court Opens the Door for More Oilfield Contamination Lawsuits*, KING & SPALDING (June 8, 2017), <https://www.kslaw.com/blog-posts/the-texas-supreme-court-opens-the-door-for-more-oilfield-contamination-lawsuits>.

187. *Id.*

188. *Forest Oil Corp. v. El Rucio Land & Cattle Co.*, 518 S.W.3d 422, 426 (Tex. 2017).

189. *Id.* at 427.

190. *Id.*

191. *Id.* at 428.

192. *Id.*

193. See Stakelum, *supra* note 186.

for the fair market value of the pore space.¹⁹⁴ Although the exact valuation of the pore space is difficult to determine because it depends on the storage capacity, it can be assumed that the damages would be determined based on compensation the pore space owner would expect to receive if the operator were to inject the carbon.¹⁹⁵

An additional risk associated with carbon storage facilities is the danger induced seismicity poses to the surface estate and surrounding land, instigating claims against operators of CCS facilities.¹⁹⁶ In regard to small, field-scale operations, arguments exist that these facilities are not at risk for induced seismic activity because of their size and lower injection rates.¹⁹⁷ However, research shows that the magnitude levels resulting from the injections of large, commercial CCS projects pose a significantly greater risk for induced seismicity.¹⁹⁸ This potential liability imposes a risk on the operator because not only can seismicity induced by fluid injection cause surface damage, but the seismic activity may damage the carbon storage infrastructure and primary seal.¹⁹⁹

Thus, considering the hefty, up-front investment required to construct an appropriate facility and the continued capital and operating costs, the 45Q tax credit remains inadequate when weighed against potential liabilities associated with CO₂ storage facilities.²⁰⁰ Accordingly, when balancing the costs and liabilities against the current incentives available for CCS, it seems that if Texas wishes to encourage CCS investment, shifting liability to the state is an appropriate addition to the existing incentives.²⁰¹

2. *The Current Texas Laws Fail to Encourage Oil and Gas Companies to Be CCS Operators*

Currently, the Texas laws in place inadequately motivate companies to become operators of CCS facilities because the laws fail to show the government's support of companies investing in carbon capture

194. See *The Value and Uses of Pore Space as a Property Right*, REALTORS LAND INST. (June 8, 2017), <https://www.rliland.com/Voices/The-Voices-of-Land-blog/ArticleID/284/The-Value-And-Uses-Of-Pore-Space-As-A-Property-Right> [hereinafter *Pore Space as a Property Right*].

195. *Id.*; WESLEY D. PECK ET AL., ENERGY & ENV'T RSCH. CTR. UNIV. OF N.D., PORE SPACE: TECHNICAL AND LEGAL CONSIDERATIONS FOR CO₂ STORAGE IN NORTH DAKOTA 10 (2022), https://www.fredlaw.com/assets/htmldocuments/2023/03/Bender_WDPPoreSpaceOct22.pdf.

196. Ajayi et al., *supra* note 180, at 1054.

197. *Id.*

198. A. Nicol et al., *Induced Seismicity and Its Implications for CO₂ Storage Risk*, 4 ENERGY PROCEDIA 3699, 3700, 3704 (2011).

199. *Id.*

200. *Incentives for CO₂ Capture, Transport and Storage*, CO₂ CAPTURE PROJECT, https://www.co2captureproject.org/xt457PuN/report/CCP2_Principles_CCS_Incentives.pdf (last visited Mar. 31, 2025).

201. See discussion *supra* Section III.B (explaining that current incentives fail to encourage most operators from investing in carbon storage when the initial and operating costs are large). Although preventative measures exist to lessen the risk of liability, the possibility of leakage or induced seismicity still exists. Stakelum, *supra* note 186.

technologies.²⁰² For instance, § 382.508(a) of the Texas Clean Air Act states that “[t]he transfer of title to the state . . . does not relieve an operator of carbon dioxide of liability for any act or omission regarding the generation of stored carbon performed before the carbon dioxide was stored.”²⁰³ This statute places total responsibility for all claims of liability on the operator.²⁰⁴

Similarly, other states such as Wyoming used to have a comparable statute to Texas that placed all liability on parties injecting CO₂.²⁰⁵ However, Wyoming now shifts liability from the operator onto the state after a certificate of completion is issued, which is contingent upon meeting certain criteria laid out in a statute.²⁰⁶ This change regarding carbon storage and sequestration was Wyoming’s effort to address investors’ concerns of indefinite liability for carbon storage facilities.²⁰⁷ Wyoming changing its previous liability statute for operators shows the value that shifting liability holds for attracting CCS projects.²⁰⁸

3. *Shifting Liability Will Reduce Potential Future Costs and Encourage Carbon Capture and Storage Development*

Shifting liability achieves the goal of encouraging investment in CCS facilities because it reduces possible future costs.²⁰⁹ Therefore, being released from long-term liability would allow operators to face less unknowns regarding the required capital for CCS facilities.²¹⁰

The state should assume liability, especially considering the uncertainty surrounding the utilization of CCS in the future.²¹¹ To expand, the future use of CCS hinges on multiple factors such as “the cost to capture [carbon], the cost and capacity to transport and sequester it, federal and state regulations,

202. *Actions for Policy Makers*, IEA, <https://www.iea.org/reports/the-role-of-ccus-in-low-carbon-power-systems/actions-for-policy-makers> (last visited Mar. 31, 2025).

203. TEX. HEALTH & SAFETY CODE ANN. § 382.508(a). However, § 382.508(b) relieves the producer of carbon dioxide from liability. *Id.* § 382.508(b).

204. *Id.* § 382.508(a).

205. Allan Ingelson, *Long-Term Liability for Carbon Capture and Storage in Depleted North American Oil and Gas Reservoirs – A Comparative Analysis*, 31 ENERGY L.J. 431, 441 (2010).

206. Carson Tanner & Tara Righetti, *What Every Wyoming Landowner Should Know About Carbon Capture and Storage*, SCH. OF ENERGY RES., <https://www.uwyo.edu/ser/research/centers-of-excellence/cegr/files/docs/landowners-guide.pdf> (last visited Mar. 31, 2025) (“When an injector receives a certificate of project completion, the injector is ‘forever released from all regulatory requirements associated with the continued storage and maintenance of the injected carbon dioxide.’”).

207. Dustin Bleizeffer, *Bills Would Shift CO₂ Storage Liability to Wyo, Force Carbon Capture*, WYOFILE (Feb. 15, 2022), <https://wyofile.com/bills-would-shift-co2-storage-liability-to-wyo-force-carbon-capture/>.

208. *See id.*; *States Look to Attract CCS Projects Through Laws Shifting Long Term CO₂ Storage Liabilities*, NIXON PEABODY (May 2, 2022), <https://www.nixonpeabody.com/insights/articles/2022/05/02/states-look-to-attract-ccs-projects-through-laws-shifting-long-term-co2-storage-liabilities> [hereinafter *States Attracting CCS Projects*].

209. *Id.*

210. *Id.*

211. *See* MUSICK, *supra* note 143, at 2.

and the development of clean energy technologies that could decrease the demand for CCS.²¹²

Without developments in CCS technology, costs will likely not be reduced in the near future.²¹³ For instance, the necessary capital to build a network for transporting CO₂ is immense, projected to be a couple billion dollars for a regional network and a significant cost of several hundreds of billions of dollars for the construction of a national network.²¹⁴ It is also important to note that research is still being conducted to determine what amount of carbon would have to be permanently stored to considerably mitigate climate change.²¹⁵

The future liabilities that operators could face include the potential responsibility of paying for damages that may arise from induced seismic activity or surface and subsurface leakages.²¹⁶ These issues may occur, not from operator negligence, but from the unknown and unpredictable implications that may result in harboring carbon permanently.²¹⁷

Overall, the financial obligation associated with CCS is likely the most influential factor affecting a company's decision to engage in carbon storage.²¹⁸ Operators face the current known and up-front costs coupled with future operational, maintenance, and liability costs of carbon storage facilities.²¹⁹ Therefore, relieving operators of carbon storage facilities from long-term liability would aid in encouraging investment in these facilities.²²⁰

C. The Proposed Legislation Should Be Adopted Because It Aligns with Public Policy

Legislation shifting liability allows for reduced potential future costs to operators, encouraging investment in CCS projects.²²¹ Currently, the federal government is pursuing net-zero GHG emissions by no later than 2050.²²² This intensive goal of achieving net-zero emissions is only obtainable through capturing and storing CO₂.²²³

State legislative findings included in carbon capture regulatory frameworks have also recognized how the use of CO₂ may benefit the public

212. *Id.*

213. *Id.*

214. *Id.*

215. *Id.*

216. *See supra* text accompanying notes 134–42 (describing the potential liabilities that may arise for operators of carbon storage facilities).

217. *See Mahjour & Faroughi, supra* note 12.

218. *Id.* at 10.

219. MUSICK, *supra* note 143, at 19.

220. *Id.* at 21–22.

221. *See id.*

222. Taylor & Coleman, *supra* note 22.

223. *See id.*

interest.²²⁴ In the North Dakota Century Code, the state legislature incorporated language stating that “it is in the public interest to promote the use of carbon dioxide to benefit the state, to help ensure the viability of the state’s coal and power industries, and to benefit the state economy,” referring to the use of CO₂ when conducting hydraulic fracturing.²²⁵ Similarly, Nebraska’s legislature declared that promoting carbon storage “will benefit the state and the global environment by reducing greenhouse gas emissions . . . ensur[ing] the viability of the state’s energy and power industries, to the economic benefit of Nebraska and its citizens.”²²⁶

Additionally, legislation that supports increased investment in CCS projects comports with public policy because there are existing financial incentives and funding provided by the federal government.²²⁷ For example, several acts were passed between 2020 and 2022 to assist in the funding of carbon transport and storage infrastructure with the grandest legislative action being the Inflation Reduction Act.²²⁸ The Inflation Reduction Act made significant amendments to the Section 45Q tax credit and “increased existing loan authority . . . by approximately \$100 billion” because of low interest from private sector financing.²²⁹

Thus, the current incentives and funding from the federal government show its commitment to encouraging companies to join the battle in combatting climate change.²³⁰

However, the existing liabilities and costs still outweigh the current incentives available, especially in regard to smaller operators, who lack the capital that some larger operators possess.²³¹ Occidental Petroleum (Oxy) is an example of a major player who is heavily invested in CCS.²³² For instance, in August 2023, Oxy purchased Carbon Engineering, a company specializing in direct air capture technology, for \$1.1 billion dollars.²³³ Therefore, the state assuming the long-term liabilities associated with CO₂ storage is a crucial policy component that Texas should adopt to encourage small operators to pursue these capital-intensive projects.²³⁴

224. See NEB. REV. STAT. § 57-1602 (2024); N.D. CENT. CODE § 38-08-25(2) (2025).

225. N.D. CENT. CODE § 38-08-25(2) (2025).

226. NEB. REV. STAT. § 57-1602 (2024).

227. See Taylor & Coleman, *supra* note 22, at 20–24.

228. *Id.* at 20–21 (discussing the purposes behind the 2020 Energy Act, the Consolidated Appropriations Act of 2021, and the Infrastructure Investment and Jobs Act of 2021).

229. *Id.* at 21.

230. See *id.* at 20–24.

231. See DECARBONIZATION, *supra* note 23 (noting that federal tax credits may be insufficient to counteract the costs of carbon storage).

232. Occidental Enters into Agreement to Acquire Direct Air Capture Technology Innovator Carbon Engineering, OXY (Aug. 15, 2023), https://www.oxy.com/siteassets/documents/news-releases/pr-081523_occidental-enters-into-agreement-to-acquire-direct-air-capture-technology-innovator-carbon-engineering.pdf.

233. *Id.*

234. *States Attracting CCS Projects*, *supra* note 208.

D. Texas Should Implement a Monitoring Period of Twenty Years

A monitoring period of twenty years is an important component of Texas's legislation shifting liability from operators onto the state.²³⁵ During the monitoring period, operators must meet particular criteria before being awarded a certificate of completion, which relieves the operator of liability.²³⁶ The monitoring period preserves the integrity of the CCS facility and “[e]nsure[s] and document[s] effective injection well controls.”²³⁷ Additionally, monitoring “[d]etect[s] leakage and provide[s] an early warning of any seepage or leakage that might require mitigating action.”²³⁸

1. A Monitoring Period Will Prevent Operators from Acting Carelessly

The implementation of a monitoring period will ensure operators act according to the standard of a reasonably prudent operator. Some remain concerned that absolving operators of liability encourages operator negligence, but the implementation of a monitoring period post injection and after the closure of sites negates those concerns.²³⁹ They argue that by modifying who is liable for the long-term liability of the storage unit, operators are disincentivized to exercise due diligence when injecting carbon.²⁴⁰

However, this opinion is unwarranted because of the technologies available to operators when monitoring onshore facilities and the criteria operators must meet to be awarded with no liability.²⁴¹ For instance, the current monitoring technologies available to operators aid in the early detection of issues relating to CO₂ storage sites.²⁴²

Additionally, the RRC will require operators to meet certain criteria before relieving the operator of complete liability and awarding a certificate of completion; thus, the release of liability is not guaranteed.²⁴³ Therefore, implementing a monitoring period in which the operators of CCS facilities must meet the particular criteria required to receive the certificate of completion will deter operators from committing negligent acts.²⁴⁴

235. See ABANADES ET AL., *supra* note 31, at 234.

236. *See id.*

237. *Id.*

238. *Id.*

239. See Anderson, *supra* note 151.

240. *Id.*

241. ABANADES ET AL., *supra* note 31, at 234–37.

242. *Id.* at 235–37; see *supra* Part II (discussing the various ways operators may monitor CCS facilities, allowing for early detection of issues).

243. See generally WYO. STAT. ANN. § 35-11-319 (2024) (listing the required criteria).

244. *Id.*; see *supra* Part II (explaining how other states' monitoring periods operate and the criteria that must be met).

2. Multiple Jurisdictions Have Successfully Implemented This Monitoring Period or Similar Ones

Texas is capable of effectively implementing a monitoring period because several states have also employed one following the issuance of a certificate of project completion.²⁴⁵ In particular, Louisiana, Montana, Wyoming, and North Dakota have all implemented liability-shifting statutes with a specified monitoring period before the regulatory agency of the state issues a certificate of completion.²⁴⁶

Though all these states differ in the time in which liability transfers from the operator to the state, Texas should adopt a monitoring period like Wyoming because of the similarities of the two states' laws that classify CO₂.²⁴⁷ To expand, both Texas and Wyoming label CO₂ as a commodity and a pollutant.²⁴⁸ Texas and Wyoming also share strong energy industries and are among the top five energy-producing states.²⁴⁹ Additionally, monitoring periods for longer lengths of time such as Louisiana's fifty-year monitoring period are too extensive.²⁵⁰ Thus, Texas adopting a twenty-year monitoring period is a more reasonable duration of time that will sufficiently provide enough time to discover any act of operator negligence.²⁵¹

IV. OTHER IMPORTANT CONSIDERATIONS REGARDING THE
IMPLEMENTATION OF A STATUTE TO SHIFT LONG-TERM LIABILITY TO THE
STATE

In addition to the proposed legislation above,²⁵² other considerations that affect carbon sequestration should be addressed to sufficiently implement the statute. These other considerations regard the EPA granting Texas primacy for Class VI wells and the Texas Legislature determining whether the surface estate or the mineral estate owns the pore space.²⁵³ Texas

245. See *supra* Section II.B.3 (discussing other jurisdictions whose legislatures enacted liability-shifting statutes).

246. See *supra* Section II.B.3 (discussing the monitoring periods that are a part of other states' liability-shifting statutes).

247. See TEX. HEALTH & SAFETY CODE ANN. §§ 382.003(2)–(3), 382.05102(a) (classifying CO₂ as a type of GHG emission); 20-6 WYO. CODE R. § 3(b) (LexisNexis 2024) (including CO₂ in the definition of GHG which is an air pollutant).

248. LIABILITY PROTECTION, *supra* note 24, at 2, 11.

249. *How Much Energy Does Your State Produce*, U.S. DEP'T OF ENERGY (Nov. 10, 2014), <https://www.energy.gov/articles/how-much-energy-does-your-state-produce#:~:text=In%20fact%2C%20the%20top%20five,in%20the%20U.S.%20each%20year>.

250. See LA. STAT. ANN. § 30:1109(A)(1) (2024).

251. See WYO. STAT. ANN. § 35-11-319(b) (2024).

252. See *supra* Section III.A (describing the proposed legislation for Texas to assume long-term liability for carbon storage facilities once the operator meets the required criteria within the twenty-year monitoring period).

253. See *supra* text accompanying notes 193–201 (reasoning that if Texas receives primacy and the Texas legislature determines pore space ownership, investment in carbon storage would be encouraged

receiving primacy would allow the RRC to issue permits to support the operation of carbon storage facilities in Texas.²⁵⁴ Further, determining pore space ownership would provide clarity of who is to receive damages for subsurface trespass and simplify site selection for onshore facilities.²⁵⁵

A. Texas Needs Primacy to Increase Future Carbon Sequestration Projects

The ability of Texas to efficiently support investments in CCS facilities hinges on the state receiving primacy.²⁵⁶ As of now, the EPA has authority.²⁵⁷ However, if Texas were to receive primacy, the Class VI well permits would be issued by the RRC which would likely lead to the approval and issuance of permits, increasing the number of future CCS projects in Texas.²⁵⁸

One consideration that the EPA accounts for when delegating primacy for Class VI wells is whether a state has suitable geologic conditions and underground formations to hold injected CO₂.²⁵⁹ Therefore, if a state lacks sites that possess these characteristics, the state is unlikely to receive primacy for Class VI wells.²⁶⁰ For instance, Wyoming, a state that currently holds primacy, has several deep saline formations which are ideal for long-term CO₂ storage due to the formations' porosity and permeability.²⁶¹

Similarly, Texas is an appropriate candidate for Class VI program primacy due to its geological conditions and widespread underground formations, which are capable of holding anywhere between “661 million and 2.4 billion metric tons” of injected CO₂.²⁶²

Additionally, when providing funding to the EPA to use for UIC programs, Congress considers a state's experience when determining

and the possibility of litigation would be avoided, creating more certainty for operators of carbon storage facilities).

254. *Primary Enforcement Authority for the Underground Injection Control Program*, EPA, <https://www.epa.gov/uic/primary-enforcement-authority-underground-injection-control-program-0> (last visited Mar. 31, 2025).

255. *See infra* text accompanying notes 269–71 (discussing how the current confusion of which estate owns the pore space causes issues regarding liability and acquiring land for carbon facilities).

256. *Support Carbon Capture and Storage in Texas*, HOUS. CCS ALL., https://houstonccs.com/wp-content/uploads/2024/05/HCCS_Primary-One-Pager_Branded.pdf (last visited Mar. 31, 2025).

257. Marston & Moore, *supra* note 52.

258. *The Path Toward Primacy: Class VI Well Permitting in 2024*, THE PANTHER COS. (Apr. 26, 2024), <https://www.thepanthercompanies.com/blog/the-path-toward-primacy-class-vi-well-permitting-in-2024>.

259. ANGELA C. JONES, CONG. RSCH. SERV., R48033, CLASS VI CARBON SEQUESTRATION WELLS: PERMITTING AND STATE PROGRAM PRIMACY 9 (2024).

260. *Id.*

261. Carol D. Frost & Anne C. Jakle, *Geological Carbon Sequestration in Wyoming: Prospects and Progress*, 45 ROCKY MOUNTAIN GEOLOGY 2, 84 (2010) (“[T]he largest potential and widespread storage source is deep saline formations, which are characterized by porous limestone or sandstone rocks . . . and may be capped by low-permeability formation that prevent vertical flows of CO₂.”).

262. *Texas Implementing Carbon Capture and Storage Technology*, REG'L CARBON CAPTURE DEPLOYMENT INITIATIVE, <https://carboncaptureeady.betterenergy.org/wp-content/uploads/2024/05/TX-2023-Factsheet.pdf> (last visited Mar. 31, 2025).

whether a state is qualified to administer the required elements of a Class IV program.²⁶³ To expand, a state's implemented UIC Class VI regulations must be "at least as strict as federal regulations" and possess similar conditions regulating "well permitting, construction, operation, recordkeeping, site closure, and other requirements established in federal Class VI regulations."²⁶⁴ Thus, states lacking experience in the regulation of producing wells will likely require more help to organize an adequate system to manage a UIC program.²⁶⁵

Texas has substantial experience in regulating the exploration and production of oil and gas and was the first state to be granted primacy for UIC programs in 1982.²⁶⁶ Moreover, the RRC assumes responsibility for regulating Class II disposal and injection wells through the EPA's grant of primacy for UIC programs.²⁶⁷ Therefore, considering Texas's history and robust experience in the regulation of UIC wells, the EPA should grant Texas primacy because the RRC is well-equipped to also receive primacy for Class VI programs.²⁶⁸

B. The Texas Legislature Should Determine Ownership of the Pore Space

Currently, Texas lacks legislation or case law defining who owns the pore space—the surface or mineral owner.²⁶⁹ Moreover, although no case exists in the context of geological storage of CO₂, Texas has conflicting case law on underground storage rights; however, the recent cases of *Lightning Oil Co. v. Anadarko E&P Onshore* and *Myers-Woodward v. Underground Services Markham* suggest that ownership of the pore space belongs to the surface estate.²⁷⁰

263. JONES, *supra* note 259, at 13–14.

264. *Id.* at 11.

265. *Id.* at 14.

266. *How Are Class II Oil and Gas Disposal Wells Regulated?*, TEX. GROUNDWATER PROT. COMM., (Mar. 20, 2024) https://tgpc.texas.gov/POE/FAQs/OG_Regulated_FAQ.pdf [hereinafter *Class II Disposal Wells*]; see generally Roger M. Olien, *Oil and Gas Industry*, TEX. STATE HIST. ASS'N, <https://www.tshaonline.org/handbook/entries/oil-and-gas-industry> (last visited Mar. 31, 2025) ("Texas legislature passed its first regulatory statute for oil in 1899.")

267. *Class II Disposal Wells*, *supra* note 266.

268. *Id.* Although the purposes of Class II and Class VI wells differ, the utilization of both wells involves the underground injection of CO₂. Lau, *supra* note 54.

269. Muriel Hague, *Hitchhiker's Guide on Carbon Capture and Sequestration Regulation in Texas and Beyond*, 61 HOUS. L. REV. 827, 840 (2024).

270. Tyler Roberts, *Pore Texas: Defining the Ownership of Underground Pore Space for Carbon Capture and Sequestration in Texas*, CARBON DIOXIDE REMOVAL L. 1, 14, <https://cdrlaw.org/resources/pore-texas-defining-the-ownership-of-underground-pore-space-for-carbon-capture-and-sequestration-in-texas/> (last visited Mar. 31, 2025); see *Lightning Oil Co. v. Anadarko E&P Onshore*, 520 S.W.3d 39, 47–48 (Tex. 2017); *Myers-Woodward v. Underground Servs. Markham*, No. 13-20-00172-CV, 2022 WL 2163857, at *11–12 (Tex. App.—Corpus Christi–Edinburg June 16, 2022, pet. granted) (mem. op.); cf. *Mapco, Inc. v. Carter*, 808 S.W.2d 262, 269–70 (Tex. App.—Beaumont 1991), *rev'd in part*, 817 S.W.2d 686 (Tex. 1991) (holding that a payment for the storage rights of an empty, underground salt cavern belonged to the mineral owner).

Presently, the only Texas case to hold the mineral estate owner owned subsurface storage rights is *Mapco, Inc. v. Carter*.²⁷¹ There, the court determined that payment for storage rights in an empty, underground salt cavern belonged to the mineral estate owner, reasoning that mineral owners retain an ownership interest after the construction of an underground storage facility has been completed.²⁷² The court emphasized that the mineral estate's ownership interest not only included the ownership of the minerals but also rights to the compensation earned for use of the cavern.²⁷³

However, in *Lightning Oil Co.*, the Supreme Court of Texas held the mineral estate's ownership is limited to the minerals located in the subsurface while the surface estate "owns all non-mineral "molecules" of the land," including the "reservoir storage space" lying beneath the surface estate.²⁷⁴

Similarly, in *Myers-Woodward*, the rule that the reservoir storage space was a part of the surface estate was extended to the issue of who owned the subsurface cavern space created by the mineral estate owner's salt brining.²⁷⁵ In that case, the defendant, Myers, argued that it owned the subsurface caverns because the owner of the surface estate also owns the subsurface estate.²⁷⁶ The court, relying on *Humble Oil & Refining Co. v. West*, held that the cavern space, being a part of the subsurface of the property, belonged to the surface estate owner.²⁷⁷

Thus, Texas should affirmatively determine the pore space belongs to the surface estate in accordance with recent case law.²⁷⁸

Determining the issue of pore space is important to the issue of liability arising from CCS facilities because it will likely cause legal uncertainty.²⁷⁹ Such uncertainty could potentially deter investment in CCS projects due to an unclear regulatory framework.²⁸⁰ For instance, if carbon is injected and migrates to another's pore space, creating a claim for the fair market value of the pore space, who is to receive damages?²⁸¹ This question currently has no answer, and if Texas continues to leave pore space ownership undefined, the possibility of future litigation regarding who receives damages is likely.²⁸²

271. *Mapco, Inc.*, 808 S.W.2d at 269–70.

272. *Id.* at 277.

273. *Id.*

274. *Lightning Oil Co.*, 520 S.W.3d at 46–47.

275. *Myers-Woodward*, 2022 WL 2163857, at *11–12.

276. *Id.* at *10.

277. *Id.*; *Humble Oil & Refin. Co. v. West*, 508 S.W.2d 812, 815 (Tex. 1974) (reasoning that the ownership rights of the surface estate also include the geological structures underneath the surface).

278. *Lightning Oil Co.*, 520 S.W.3d at 47–48; *Myers-Woodward*, 2022 WL at 2163857, at *11–12. For more information, see Roberts, *supra* note 270, at 17–26.

279. Elizabeth George, *Carbon Storage In Texas: Who Owns the Underground Pore Space?*, FORBES (Oct. 29, 2019), <https://www.forbes.com/sites/uhenergy/2019/10/29/carbon-storage-in-texas-who-owns-the-underground-pore-space/?sh=138c5b122e4b>.

280. *Id.*

281. See Roberts, *supra* note 270, at 11.

282. See generally *Pore Space as a Property Right*, *supra* note 194 (discussing the commercial value of pore space ownership).

Moreover, if Texas continues to leave pore space ownership undefined and wishes for carbon storage projects to seek vast, adjoining tracts of unsevered land in rural areas of the state, the potential for carbon storage projects will be limited.²⁸³ Therefore, a determination that the pore space ownership belongs to the surface estate would resolve the issue of who is to receive damages and would make site selection for onshore facilities easier.²⁸⁴

V. CONCLUSION

The federal government is searching for the implementation of technologies and policies with the goal of achieving a net-zero economy to support sustainable energy practices.²⁸⁵ This goal is unattainable without sufficient incentives for operators to invest in carbon storage facilities when the option of flaring is a cheaper, more attractive alternative.²⁸⁶ Considering the RRC's leniency towards flaring, investment in CCS operations from oil and gas companies other than major players is unforeseeable.²⁸⁷

Thus, to encourage investment in carbon storage and discourage flaring that contributes to carbon emissions, Texas needs legislation shifting long-term liability from operators of onshore carbon storage facilities to the state.²⁸⁸ Legislation such as the one proposed will encourage investment in carbon sequestration in Texas and curing the current issue operators face of the costs and liabilities outweighing the current incentives available.²⁸⁹

In addition, to assist in the smooth operation of the proposed legislation, pore space ownership needs to be granted to the surface estate owner.²⁹⁰ This determination is necessary to combat uncertainty that will likely arise in future litigation of who is to receive damages if carbon migrates to a neighboring pore space, constituting a subsurface trespass.²⁹¹

283. Roberts, *supra* note 270, at 19.

284. George, *supra* note 279; Roberts, *supra* note 270, at 19; see Hague, *supra* note 269, at 851 (suggesting that offshore facilities eliminate the issue of pore space ownership because the owner would be the state or federal government, avoiding the determination of whether the surface or mineral estate owns the pore space).

285. Taylor & Coleman, *supra* note 22.

286. See *supra* Part III (explaining how the Texas Legislature could implement incentives to shift liability away from operators).

287. See Pskowski, *supra* note 5.

288. See *supra* Section III.A (listing out the legislation that Texas should adopt to shift long-term liability from an operator to the state).

289. See *supra* Section III.B (explaining how the proposed legislation will be a sufficient incentive to encourage investment in CCS facilities).

290. Roberts, *supra* note 270, at 20.

291. See generally *Pore Space as a Property Right*, *supra* note 194 (discussing the economic implications of owning the pore space).