



Indonesia's Legal Position on the London Protocol Amendment for Cross-Border Carbon Capture and Storage

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Abstract

Carbon Capture and Storage (CCS) projects in Indonesia face a fundamental international law problem: Article 6 of the 1996 London Protocol prohibits the cross-border export of carbon dioxide, a bar removable only through the 2009 amendment and the provisional application mechanism under Resolution LP.5(14) of 2019. Indonesia's position remains unsettled. Presidential Regulation No. 14 of 2024 permits cross-border carbon transport up to 30 percent of a site's storage capacity, yet Indonesia is still not a Contracting Party to the London Convention or Protocol. This paper examines arguments for and against Indonesia ratifying the London Protocol and its 2009 amendment, and the implications for legal certainty in cross-border cooperation, particularly with Singapore. Employing normative legal research with statutory, conceptual, and comparative approaches, grounded in international regime and compliance theory, the study finds that Indonesia presents an anomaly: a non-party operating a progressive domestic CCS regime. Its novelty lies in mapping this position, which international energy law literature has not examined closely. The contribution is a balanced framework for policymakers weighing accession and ratification against bilateral agreements, the route taken by Belgium and Denmark.

Keyword: London Protocol; Marine Pollution Law; Law of the Sea; Carbon Capture and Storage; Treaty Ratification

1. Introduction

Global climate change has pushed an international consensus that carbon capture and storage is one of the transition technologies the world cannot avoid if it wants to hit the Paris Agreement targets, especially for hard-to-abate sectors like cement, steel, and petrochemicals. The International Energy Agency estimates that hundreds to thousands of CCS facilities will be needed worldwide by

mid-century to reach net zero.¹ But cross-border CCS, where CO₂ is captured in one country and shipped for permanent storage in another country's offshore geological formations, runs straight into an international law of the sea regime that was built to prevent waste dumping at sea, not to enable it.

The London Convention of 1972 and its 1996 Protocol are the most developed international instruments governing the prevention of marine pollution from dumping waste and other matter.² A 2006 amendment to Annex 1 of the London Protocol created a legal basis for storing CO₂ in sub-seabed geological formations, but Article 6 of the Protocol flatly bars exporting waste, including CO₂ streams, for disposal in another country's territory.³ That bar became a structural obstacle for cross-border CCS, because many large emitters (Singapore, Japan, South Korea, for example) lack adequate offshore geological storage capacity, while their neighbors (Norway, Indonesia, Australia) sit on large sedimentary basins.

Recognizing the gap, Norway proposed and the London Protocol's parties adopted an amendment to Article 6 on October 30, 2009, through Resolution LP.3(4). It allows exporting CO₂ for sub-seabed geological storage as long as an agreement or arrangement exists between the exporting and receiving states.⁴ The catch was that the amendment only takes global effect once two-thirds of the 53 parties ratify it, a threshold only six countries had met by 2019. That stalemate led the Contracting Parties, at the LC41/LP14 meeting in October 2019, to adopt Resolution LP.5(14) on provisional application of the 2009 amendment, letting parties apply it early through a unilateral declaration to the IMO without waiting for formal ratification.⁵ As of now, roughly fifteen countries have ratified the 2009 amendment, including Norway, the United Kingdom, the Netherlands, Iran, Finland, Estonia, Sweden, Belgium, Denmark, and South Korea. Provisional application has already produced concrete bilateral arrangements, such as the Belgium-Denmark agreement signed on September 26, 2022, plus a broader network of cross-border cooperation frameworks across Europe.⁶ The European Union itself is pushing member states to ratify the amendment while stressing that EU law cannot substitute for this international treaty obligation.⁷

Indonesia sits in an unusual, almost paradoxical, spot in this international CCS legal picture. It is not a party to either the 1972 London Convention or the 1996 London Protocol. Among East and Southeast Asian states, only China, Japan, South Korea, and the Philippines have ratified both

¹ International Energy Agency, "Carbon Capture and Storage and the London Protocol," IEA Analysis, 2011, <https://www.iea.org/reports/carbon-capture-and-storage-and-the-london-protocol>.

² International Maritime Organization, "The London Convention and Protocol," accessed August 7, 2026, <https://www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx>.

³ International Maritime Organization, "Carbon Capture and Sequestration," accessed August 7, 2026, <https://www.imo.org/en/OurWork/Environment/Pages/CCS-Default.aspx>.

⁴ King & Spalding, "CO₂ Exports in Asia Pacific: Japan's Approval of the 2009 Amendment to the London Protocol," King & Spalding Insights, 2023, <https://www.kslaw.com/news-and-insights/co2-exports-in-asia-pacific-japans-approval-of-the-2009-amendment-to-the-london-protocol>.

⁵ IEAGHG, Exporting CO₂ for Offshore Storage – The London Protocol's Export Amendment and Associated Guidelines and Guidance, Technical Report 2021-TR02 (Cheltenham: IEAGHG, 2021), <https://www.club-co2.fr/files/2021/04/IEAGHG-2021-TR02-Exporting-CO2-for-Offshore-Storage-The-London-Protocol-s-Export-Amendment-and-Associated-Guidelines-and-Guidance.pdf>.

⁶ "Cross-Border CO₂ Transport and Storage Networks in Europe through 'Arrangements' under the London Protocol," Ocean Development & International Law (2025), <https://doi.org/10.1080/00908320.2025.2566714>.

⁷ European Commission, The EU Legal Framework for Cross-Border CO₂ Transport and Storage, Commission Services Analysis Paper (Brussels: European Commission, 2022), https://climate.ec.europa.eu/document/download/dfbbc90c-071e-4088-ada2-7af467084b30_en?filename=EU-London_Protocol_Analysis_paper_final0930.pdf.

instruments, and ERIA's own data confirms how thin ASEAN participation in this regime is.⁸ Not being a party means Indonesia is not formally bound by Article 6's prohibition, but it also cannot use the 2009 amendment's provisional application mechanism the way other parties can.

Yet Indonesia's government has moved quickly to build a domestic CCS legal framework. It started with Ministry of Energy and Mineral Resources Regulation No. 2 of 2023, covering CCS and CCUS in upstream oil and gas operations.⁹ The government then issued Presidential Regulation No. 14 of 2024 as a broader umbrella covering both oil and gas working areas and Carbon Storage Permit Areas outside the upstream sector.¹⁰ That regulation explicitly permits importing CO₂ from abroad up to 30 percent of a site's storage capacity, opening a path for cross-border carbon transport based on bilateral agreements.¹¹ Ministry Regulation No. 16 of 2024 then filled in the technical detail on exploration, storage operations, and transport.¹²

Concrete projects are already moving. The Tangguh project in West Papua, operated by bp, reached Final Investment Decision with an additional USD 7 billion in investment.¹³ The Sakakemang project in South Sumatra, run by Repsol, is targeted to come onstream in 2027 with storage capacity up to 30 million tons,¹⁴ alongside the Sunda Asri joint project between Pertamina and ExxonMobil, the Gundih project in Central Java, and the Masela project led by Inpex. On the foreign policy front, Indonesia and Singapore signed a Letter of Intent for cross-border CCS cooperation on February 9, 2024,¹⁵ which grew into a signed Southeast Asian cross-border CCS agreement on June 13, 2025, matching Singapore's target of storing 2 million tons of CO₂ per year by 2030 against Indonesia's estimated 600 gigatons of subsurface storage capacity. The Global CCS Institute even ranked Indonesia first in Southeast Asia and second in Asia-Pacific for CCS regulatory readiness in its 2024 Legal and Regulatory Indicator Report.¹⁶

Even so, this domestic regulatory progress does not automatically settle the international law question. The cross-border carbon transportation provisions in Presidential Regulation 14/2024 still require a bilateral cooperation agreement between states as the basis for issuing recommendations or permits¹⁷. In European practice, though, that kind of bilateral framework has always pointed back to compatibility with the London Protocol regime, either through full ratification of the

⁸ RKC-MPD, "International Agreements: London Convention and Protocol," ERIA Regional Knowledge Centre for Marine Plastic Debris, accessed August 7, 2026, <https://rkcmpd-eria.org/international-agreements/london-convention>.

⁹ "Indonesia's Carbon Capture Storage Policy in Comparison with Other Countries," Lexology, 2023, <https://www.lexology.com/library/detail.aspx?g=c01a878b-4a77-4b4a-b216-bf099bc5eab6>.

¹⁰ Norton Rose Fulbright, "Understanding Carbon Capture and Storage in Indonesia," Norton Rose Fulbright Publications, 2025, <https://www.nortonrosefulbright.com/en/knowledge/publications/0a53935e/understanding-carbon-capture-and-storage-in-indonesia>.

¹¹ "PR 14/2024: A Unified and Expanded Carbon Capture Storage Regulation," Lexology, 2024, <https://www.lexology.com/library/detail.aspx?g=87fb12ab-26a8-4590-8cb2-33ed5a9a3700>.

¹² Ashurst, "Indonesia Issues Further Regulations for CCS and CCUS Deployment," Ashurst Insights, 2024, <https://www.ashurst.com/en/insights/indonesia-issues-further-regulations-for-ccs-and-ccus-deployment/>.

¹³ "ESDM Ministry: CCS Business Potential to Drive Economic Growth," Indonesia Business Post, May 22, 2025, <https://indonesiabusinesspost.com/4352/policy-and-governance/esdm-ministry-ccs-business-potential-to-drive-economic-growth>.

¹⁴ Incorp Asia, "Carbon Capture and Storage Indonesia: Business of the Future," Incorp Asia Insights, 2025, <https://indonesia-incorp.asia/blogs/carbon-capture-and-storage/>.

¹⁵ Indonesia CCS Center, "MoU Signed for Cross-Border Carbon Capture & Storage (CCS) Between Indonesia and Singapore," ICCS Center, June 18, 2025, <https://icccenter.com/mou-signed-for-cross-border-carbon-capture-storage-ccs-between-indonesia-and-singapore/>.

¹⁶ "Indonesia Positions Itself as the Leading CCS Hub in Asia-Pacific," International & Indonesia CCS Forum, April 30, 2025, <https://iiccsforum.com/indonesia-positions-itself-as-the-leading-ccs-hub-in-asia-pacific/>.

¹⁷ ABNR Counsellors at Law, "Indonesia Moves to Provide Solid Legal Basis for Carbon Capture & Storage," Legal Update, 2024, <https://www.abnrlaw.com/news/indonesia-moves-to-provide-solid-legal-basis-for-carbon-capture-storage>.

2009 amendment or provisional application under Resolution LP.5(14).¹⁸ Indonesia's absence from the London Protocol's party list creates a gray zone over how obligations to protect the marine environment, allocate legal responsibility for leaks, and set monitoring-reporting-verification standards will actually be enforced in cross-border cooperation with partners that are themselves parties to the Protocol, such as Singapore, Japan, and South Korea.

2. Literature Review of the Past Ten Years and the Research Gap

International energy law scholarship over the past decade (2015 to 2025) runs along three main lines. The first is normative work on how Article 6 of the London Protocol has evolved and how well its provisional application mechanism works, documented comprehensively by IEAGHG and revisited in the *International Journal of Marine and Coastal Law*, which treats the London Convention and Protocol as the most advanced instrument responding to the overlap between the ocean crisis and the climate crisis¹⁹. The second is regional-comparative work on implementing cross-border CCS cooperation, covering the CO₂ cooperation framework in the European Economic Area²⁰, networks of bilateral arrangements in Europe, questions of regionalism in marine environmental protection for offshore energy production²¹, and the liability regime for the CCS transport phase^{22,23}. The third strand is comparative legal scholarship starting to reach into the Asia-Pacific, including Jang's 2024 study comparing London Protocol regulation and CCS technology frameworks in Australia, Indonesia, and South Korea²⁴, work on Australia's CCS industry regulation²⁵, and a case study of the Rotterdam Nucleus project that examines the international obligations of offshore CCS operators²⁶.

At the domestic level, most Indonesian literature published after 2023 focuses on the technical detail of Presidential Regulation 14/2024 and its implementing rules from a business certainty and investment angle²⁷, without connecting it in any depth to Indonesia's status under the London Protocol regime. Newer studies have started closing that gap. Research on norm fragmentation in Indonesia's offshore CCS regulation identifies overlaps among the environmental, marine, energy,

¹⁸ "The Role of the London Protocol in Advancing CCS in Europe," Carbon Management Europe, 2026, <https://carbonmanagementeurope.org/role-london-protocol-advancing-ccs-europe/>.

¹⁹ "The London Convention and Protocol: Adapting to Address the Ocean-Climate Crisis," *International Journal of Marine and Coastal Law* 39, no. 3 (2024): 519–48, https://brill.com/view/journals/estu/39/3/article-p519_13.xml.

²⁰ "Main Current Legal and Regulatory Frameworks for Carbon Dioxide Capture, Transport, and Storage in the European Economic Area," *International Journal of Greenhouse Gas Control* (2024), <https://www.sciencedirect.com/science/article/pii/S1750583624001154>.

²¹ Nikolaos Giannopoulos, "Regionalism and Marine Environmental Protection: The Case of Offshore Energy Production," *SSRN Electronic Journal*, November 15, 2021, <https://doi.org/10.2139/SSRN.3770726>.

²² "The Liability Framework for the Shipping Phase of Carbon Capture and Storage," CDR Law Working Paper, accessed August 7, 2026, <https://cdrlaw.org/wp-content/uploads/2020/04/Candidate-No-4009.pdf>.

²³ "Carbon Capture and Storage and the London Protocol," CDR Law Repository, accessed August 7, 2026, <https://cdrlaw.org/wp-content/uploads/2020/10/1-s2.0-S1876610213009648-main.pdf>.

²⁴ Hyewon Jang, "Regulation of the London Protocol and CCS Technology: A Legal Framework Analysis of Australia, Indonesia and RoK," *Wonkwang University Legal Research Institute* 40, no. 4 (December 31, 2024): 265–92, <https://doi.org/10.22397/WLRI.2024.40.4.265>.

²⁵ Matthew Holding, "Regulation of the Australian Carbon Capture and Storage Industry," *The APPEA Journal* 63, no. 2 (May 11, 2023): S395–98, <https://doi.org/10.1071/AJ22137>.

²⁶ Laia Branco de Almeida, "The International Law of Energy of Offshore Carbon Capture and Storage: The Rotterdam Nucleus Project Case Study," *Netherlands Yearbook of International Law* (2022), <https://doi.org/10.1177/14614529221080037>.

²⁷ "Dissecting Indonesia's Regulation on Carbon Capture Storage: Analysis on Presidential Regulation Number 14 of 2024 on Carbon Capture Storage," *Lexology*, 2024, <https://www.lexology.com/library/detail.aspx?g=85040ce1-445e-4c55-a3b9-993258aa0335>.

and climate regimes that complicate legal certainty over offshore carbon storage governance²⁸. Meanwhile, scholarship on the Indonesia-Singapore transboundary legal framework points out that, absent a comprehensive treaty regime, customary international law principles like the no-harm rule and due diligence serve as the residual normative framework for the two countries' cross-border CCS cooperation²⁹.

Three gaps stand out. First, no study has systematically weighed the arguments for and against ratifying the London Protocol and its 2009 amendment from the standpoint of Indonesia's national interest as a non-party that also happens to be the largest destination for cross-border CCS investment in Southeast Asia. Second, existing literature tends to analyze the London Protocol regime from the perspective of CO₂-exporting states (net emitters), even though Indonesia sits on the receiving end as a storage host, which means its interests are calculated on a structurally different basis. Third, there is no comprehensive mapping of non-ratification alternatives, such as provisional application or pure bilateral arrangements, for a country like Indonesia that is not a party at all, as opposed to a country that simply hasn't ratified the amendment yet.

1.4 Novelty, Objectives, Contribution, and Research Questions

This study's novelty rests on three points. First, it treats Indonesia not as a party that has yet to ratify an amendment, the framing usually applied to European countries, but as a non-party with a progressive domestic regime, a fairly new analytical category in the literature. Second, it builds a pro-con framework that specifically weighs the interests of a storage host country, a departure from most of the literature's exporter-side viewpoint. Third, it ties normative analysis of international law to the empirical, present-day development of Indonesia's CCS projects in 2024 and 2025, including the Indonesia-Singapore agreement, producing a reading that is current.

The objectives are: (1) to identify and analyze the arguments in favor of Indonesia ratifying the London Protocol and its 2009 amendment; (2) to identify and analyze the arguments against, or counseling caution on, that ratification; and (3) to formulate policy recommendations for the Indonesian government on the legal path best suited to developing cross-border CCS projects.

The contribution is both theoretical and practical. Theoretically, it adds to the international regime law literature a case study of a non-party that is nonetheless a *de facto* key actor within the regime. Practically, it gives the Ministry of Foreign Affairs, the Ministry of Energy and Mineral Resources, and the Coordinating Ministry for Maritime Affairs and Investment a basis for deciding Indonesia's position on acceding to the London Convention and Protocol, and for weighing the alternative legal routes available when negotiating bilateral CCS agreements with partners such as Singapore, Japan, and South Korea.

The research questions are: (1) What are the main arguments supporting Indonesia's ratification of the London Protocol and its 2009 amendment for the development of national CCS projects? (2) What are the main arguments counseling against, or urging caution on, that ratification? (3) How does Indonesia's current domestic legal framework, particularly Presidential Regulation 14/2024, interact with Indonesia's non-party status under the London Protocol regime? (4) Which legal path

²⁸ "Norm Fragmentation in Indonesia's Offshore Carbon Capture and Storage Regulation: A National and International Legal Analysis," *Supremasi Hukum: Jurnal Kajian Ilmu Hukum*, 2025, <https://ejournal.uin-suka.ac.id/syariah/Supremasi/article/view/3400>.

²⁹ "Toward a Transboundary Legal Framework: The Indonesia-Singapore Carbon Capture and Storage Agreement," *Climate and Energy Law Review*, 2026, <https://www.sciencedirect.com/science/article/pii/S2772655X26000534>.

best serves Indonesia's interests in facilitating cross-border CCS cooperation given this ratification dilemma?

3. Research Method

This study uses normative legal research, examining law as written norms through primary, secondary, and tertiary legal materials. The primary materials include the 1972 London Convention, the 1996 London Protocol with its 2006 and 2009 amendments, Resolution LP.5(14) of 2019, the 1982 United Nations Convention on the Law of the Sea, the 2015 Paris Agreement, and the relevant Indonesian regulations, chiefly Presidential Regulation No. 14 of 2024, Ministry Regulation No. 2 of 2023, and Ministry Regulation No. 16 of 2024. The secondary materials include academic journals, reports from international bodies (IMO, IEA, IEAGHG, Global CCS Institute), law firm analyses, and official reporting on the development of Indonesia's CCS cooperation between 2023 and 2025.

Three approaches were combined: a statute approach, checking how Indonesia's domestic regulations line up against international norms; a conceptual approach, unpacking key concepts such as waste export, provisional application, and contracting party; and a comparative approach, setting Indonesia's position against countries that have ratified the 2009 amendment (Norway, the United Kingdom, South Korea) or applied it provisionally (Belgium, Denmark).

The analysis draws on international regime theory, which treats an international legal regime, the London Protocol included, as a set of principles, norms, rules, and decision-making procedures, implicit and explicit, that align actors' expectations around a given issue. This theory explains why states are willing to accept a regime that limits their sovereignty (here, the ban on waste export) in order to reach the collective goal of protecting the marine environment and mitigating climate change. The study also draws on compliance theory to examine the incentives and disincentives shaping Indonesia's consideration of accession and ratification, including reputational benefits, legal certainty for investors, and the administrative and diplomatic costs of ratification. Both frameworks are combined with a cost-benefit approach common in energy policy studies, structuring the weighing of ratification's advantages and disadvantages that runs through the discussion below.

4. DISCUSSION

3.1 Indonesia's Position in the London Protocol Regime: An Anomaly

As noted in the introduction, Indonesia occupies an unusual spot compared to the countries that dominate the London Protocol literature. The countries that literature usually focuses on, Norway, the United Kingdom, the Netherlands, EU member states, Japan, South Korea, and Australia, are all London Protocol parties wrestling with whether and when to ratify the 2009 amendment. Indonesia has not even signed or acceded to the parent instrument. That leaves Indonesia facing a two-layered legal question: first, whether it should accede to the London Convention and Protocol at all, and second, if it accedes, whether it should also ratify the 2009 amendment on CO₂ export.

This anomaly carries real analytical weight. Because Indonesia is not a party, Article 6's prohibition does not formally bind it as a treaty obligation (*pacta tertiis nec nocent nec prosunt*: a treaty does not bind third parties). But because Indonesia's cross-border CCS partners, Singapore (also not a party), Japan, and South Korea, each have a different relationship to the regime, Indonesia's

unclear position is more likely to create legal uncertainty in bilateral negotiations than the freedom of action it might appear to offer.

3.2 Arguments in Favor of Ratifying the London Protocol and the 2009 Amendment

Legal certainty and a common cross-border standard. The most basic case for ratification is that full membership in the London Protocol and ratification of the 2009 amendment gives Indonesia direct access to the agreement-or-arrangement mechanism, already tested and internationally recognized as the basis for cross-border CCS cooperation. Rather than negotiating a legal framework from scratch with every bilateral partner, Indonesia could use the template the IMO has already developed through its CO₂ Specific Guidelines and Guidance on the Implementation of Article 6.2, which spells out how licensing and enforcement responsibilities split between exporting and receiving states.

A stronger reputation as a regional CCS hub. Indonesia's government has openly stated its ambition to become the CCS hub of Southeast Asia³⁰. That claim carries more weight with multinational investors, BP, ExxonMobil, Repsol, Inpex, if it rests on full international legal certainty rather than domestic rules a presidential regulation can change at any time. Global CCS Institute analysis that ranks Indonesia highly in its Legal and Regulatory Indicator Report already factors in the clarity of cross-border legal pathways as one indicator, so ratification could strengthen, not just round out, Indonesia's competitive position relative to Australia, which has already ratified the 2009 amendment.

Alignment with major carbon trade partners. Singapore, though also not a party to the London Protocol, has built the S-Hub consortium with ExxonMobil and Shell, targeting capture of 2.5 million tons of CO₂ a year by 2030, while Japan and South Korea, two other potential CCS partners for Indonesia, are parties that have already ratified the 2009 amendment. For a project like the Tangguh cooperation with Japan's Chubu Electric Power, Indonesian membership in the same regime would simplify legal due diligence and cut the risk of disputes over how to interpret the legal status of cross-border CO₂ flows.

Lowering liability risk and strengthening environmental accountability. The London Protocol regime offers international monitoring, reporting, and verification standards already tested across multiple jurisdictions, plus an early framework for allocating legal responsibility if CO₂ leaks from a storage site. Ratification would give Indonesia direct access to how these norms develop, as a party helping shape their interpretation at the Consultative Meeting of Contracting Parties, rather than simply receiving norms other countries wrote.

Consistency with other international commitments. Indonesia ratified the Kyoto Protocol in 2004 and the Paris Agreement in 2016³¹, both of which implicitly accommodate CCS as a mitigation option and open room for international cooperation through Article 6 of the Paris Agreement. Ratifying the London Protocol would be a logical extension of a climate commitment trajectory Indonesia is already on, strengthening the coherence of its foreign policy on environment and energy.

³⁰ ARMA Law, "Indonesia's Carbon Capture Storage Regulatory Overview: Presidential Regulation No. 14 of 2024," Newsflash, 2024, <https://www.arma-law.com/news-event/newsflash/indonesias-carbon-capture-storage-regulatory-overview-presidential-regulation-no-14-of-2024>.

³¹ United Nations Framework Convention on Climate Change, "Indonesia: Party Profile," accessed August 7, 2026, <https://unfccc.int/node/61083>.

3.3 Arguments Against, or Counseling Caution on, Ratification

No structural urgency for a receiving state. The strongest argument against rushing to ratify is that Article 6's prohibition was written to govern exporting states, not receiving or storing states. Because Indonesia would be a storage host, not an exporter, staying outside the regime does not, as a technical matter, stop Indonesia from receiving CO₂ from abroad; the prohibition targets the sending state. The legal pressure to ratify quickly therefore falls more heavily on exporting states like Singapore and Japan than on Indonesia as a receiver.

The political and administrative cost of domestic ratification. Acceding to and ratifying an international treaty in Indonesia requires approval from the House of Representatives under Law No. 24 of 2000 on International Treaties, for treaties touching national territory, sovereignty, and the environment, a category that could well include the London Protocol given its connection to waste disposal within Indonesia's maritime jurisdiction. That process is slow even in developed countries: only six of the fifty-three parties managed to ratify the 2009 amendment in its first ten years, and the literature notes that ratifying marine treaties often sits outside the priorities of the energy ministries that actually have the most at stake in CCS, requiring cross-ministerial coordination that is anything but simple.

Norm fragmentation and the risk of overlapping domestic regulation. Research on norm fragmentation in Indonesia's offshore CCS regulation shows that the domestic legal framework is already spread across several regimes, environment, marine affairs, energy, and climate change, that are not fully harmonized with one another. Layering on a new international treaty obligation before aligning the domestic framework first risks making that fragmentation worse rather than solving it. Rushing to ratify without harmonizing implementing legislation could create conflicts among the marine affairs law, the environmental protection law, Presidential Regulation 14/2024, and the new treaty obligation.

The flexibility of a purely bilateral route as a faster alternative. International practice shows that cross-border CCS cooperation can proceed through non-treaty bilateral arrangements that do not require ratifying the London Protocol first, as long as both countries agree on comparable safety and environmental standards. The Indonesia-Singapore Letter of Intent from February 2024, which grew into a bilateral agreement by June 2025, moved forward without waiting for Indonesia's membership status under the London Protocol, showing in practice that ratification is not an absolute prerequisite for real cooperation. The EU precedent reinforces this point: the CO₂ Storage Directive and the EU ETS are allowed to function as the substitute arrangement for EEA countries without requiring each one to individually ratify the Article 6 amendment.

Long-term environmental liability risk for the storage state. As the country that would host CO₂ from abroad, Indonesia could end up carrying long-term environmental and legal liability for leaks or CO₂ migration across geological formations, while the main economic benefit (lower carbon compliance costs) accrues to the exporting country. The international legal framework for liability during the CCS transport and storage phase is still developing and remains unsettled even in more advanced regions like Europe, so ratifying early could lock Indonesia into a liability regime that does not fully serve its interests as a storage host, before there is clarity on how liability should be fairly divided among emitters, transporters, and storage operators.

Technical challenges and institutional capacity. Indonesia's storage potential is estimated at 577 gigatons, or more than 600 gigatons by other calculations, but the institutional capacity needed

to monitor compliance with demanding international standards, seabed surveys, CO₂ migration modeling, and an MRV system equivalent to ISO 27914:2017, is still being built. Observers have flagged technical risks such as corrosion from CO₂ contact with formation water that could eventually cause leaks, plus capture costs that an ERIA study puts at around USD 45.92 per ton and storage costs around USD 15.93 per ton. Ratifying an international treaty without adequate technical and institutional readiness risks creating obligations Indonesia would struggle to meet consistently.

3.4 How Presidential Regulation 14/2024 Interacts with Indonesia's Non-Party Status

Presidential Regulation 14/2024 requires that cross-border carbon transport rest on a bilateral cooperation agreement between states, which then serves as the reference point for issuing recommendations or permits under each country's own laws. That approach cleverly places the burden of international legal compliance at the level of the bilateral agreement rather than multilateral treaty membership. It matches a global precedent: the EU framework holds that the CO₂ Storage Directive and the EU ETS can function as the arrangement Article 6.2 of the London Protocol requires, without needing a new treaty, while Norway and the Netherlands pioneered provisional application of the 2009 amendment through unilateral declarations later backed by concrete bilateral agreements.

This purely bilateral approach has real limits, though. First, it depends on the goodwill and legal capacity of Indonesia's bilateral partners to set environmental protection standards equivalent to the London Protocol without an independent IMO multilateral oversight mechanism. Second, when an Indonesian bilateral partner is a London Protocol party that has ratified the 2009 amendment, South Korea, for example, an asymmetry of legal obligation can result: that partner is bound to London Protocol standards in its dealings with other parties, but could negotiate different standards, higher or lower, with Indonesia as a non-party. Third, without membership in the Consultative Meeting of Contracting Parties, Indonesia has no vote in shaping further technical norms, including revisions to the CO₂ Specific Guidelines and discussions on marine geoengineering that have been on the LC/LP meeting agenda since 2022.

3.5 Weighing the Interests of a Storage Host against an Exporting State

What sets Indonesia apart from most countries that have ratified the 2009 amendment, Norway, the United Kingdom, the Netherlands, South Korea, is its structural role as a storage host rather than an exporter. The Article 6 amendment was fundamentally designed to give legal room to CO₂-exporting states that lack adequate geological capacity of their own. Countries that rushed to ratify generally had a direct stake as parties needing legal certainty to send CO₂ abroad, or at least expected to play a dual role as both exporter and receiver within a regional carbon supply chain.

Indonesia's calculation is structurally different. Because Indonesia is projected to act almost entirely as a receiver and storer, with no significant plan to export domestic CO₂ abroad given its own storage capacity running into the hundreds of gigatons, the legal and diplomatic pressure to ratify the 2009 amendment quickly falls proportionally more on exporting states like Singapore and Japan than on Indonesia. This is not an argument that Indonesia can ignore the regime altogether. Rather, Indonesia holds more bargaining leverage to negotiate when and how it commits to the regime than it would if it were a net exporter needing fast, certain access to foreign storage markets.

The upshot is that Indonesia's ratification decision should be guided more by strengthening its bargaining position and managing long-term risk than by the market-access urgency that typically pushes CO₂-exporting states to ratify quickly.

3.6 Synthesis: Toward the Optimal Legal Path for Indonesia

Weighing the arguments above, this study finds that Indonesia's ratification decision is not a binary choice between ratifying or not, but a matter of sequencing and staged risk management. Three scenarios are worth the government's consideration.

The first scenario, full and immediate accession to the London Convention and Protocol along with ratification of the 2009 amendment, delivers maximum legal certainty but requires a long political and legislative process and risks locking Indonesia into a liability regime that is not yet fully settled. The second scenario, keeping the status quo as a non-party and relying entirely on bilateral agreements under Presidential Regulation 14/2024, offers flexibility and speed, as the Indonesia-Singapore case shows, but risks long-term legal uncertainty and an asymmetry of obligation with partners that are London Protocol parties. The third scenario, the middle path this study recommends, is for Indonesia to accede to the London Convention and Protocol without rushing to ratify the 2009 amendment, while aligning bilateral agreements currently being negotiated with the substance of the IMO's CO₂ Specific Guidelines even before that substance becomes a formal treaty obligation.

This third scenario would let Indonesia gain participation rights in the norm-setting forum (by becoming a party to the parent Protocol) while keeping policy room to maneuver before committing to a CO₂ export-import liability regime whose implications for a storage host state are not yet fully clear. The approach is consistent with the substantive-application-without-formal-ratification practice the EU has used in a different context, and it buys Indonesia time to build MRV institutional capacity and harmonize domestic regulation, as recommended by the norm fragmentation literature, before eventually weighing ratification of the 2009 amendment once precedent and bilateral practice, including with Singapore, Japan, and South Korea, provide a more mature empirical basis for judging the balance of benefits and risks to Indonesia as a storage host.

5. CONCLUSION

This study shows that the question of whether Indonesia should ratify the London Protocol and its 2009 amendment is not a simple matter of international legal compliance. It is a strategic calculation of national interest as a cross-border carbon storage host, not as an exporting state like most of the parties that have already ratified the amendment. The arguments for ratification, legal certainty, a stronger reputation as a regional CCS hub, alignment with carbon trade partners, lower liability risk, and consistency with climate commitments, stand against equally substantial arguments against it: no structural urgency for a receiving state, the political and administrative complexity of domestic ratification, the risk of worsening norm fragmentation, the proven flexibility of the bilateral route without ratification, unresolved long-term environmental liability exposure, and limited technical and institutional capacity.

Indonesia's domestic legal framework under Presidential Regulation 14/2024 has already provided a pragmatic, bilateral-agreement-based path that lets cross-border CCS projects move forward without waiting for full London Protocol membership, as the concrete progress of

Indonesia-Singapore cooperation demonstrates. But this path has real structural limits over the long run, particularly the asymmetry of obligation with partners that are London Protocol parties, and Indonesia's lack of a voice in the forums that set international CCS norms.

This study recommends a middle path: Indonesia should accede to the London Convention and Protocol without an immediate obligation to ratify the 2009 amendment, while aligning bilateral agreements under negotiation with the substance of the IMO's CO₂ Specific Guidelines. This staged approach lets Indonesia gain legitimacy and participation rights within the international regime while preserving policy flexibility until its institutional capacity and the cross-border liability regime mature fully. Further research should examine, empirically, how the Indonesia-Singapore bilateral agreement signed in 2025 plays out in practice, and how Indonesia might influence the development of international CCS technical norms even before it becomes a full party.

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