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Diagnosing Governance Dysfunctions of CCS in Indonesia

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POLICY BRIEF

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Highlights

1. Presidential Regulation No. 14/2024 marks a historic step in establishing Indonesia's carbon capture and storage (CCS) framework, yet remains insufficiently detailed to support effective project permitting, liability, or long-term stewardship
2. Indonesia faces first-order governance failures (misaligned incentives, regulatory gaps, and unclear CO₂ ownership) hindering investment and delaying pioneer projects like the Gundih CCS project
3. Indonesia also faces second-order governance failures, including weak analytical, monitoring and managerial capabilities in ministries and subnational governments
4. CCS effectiveness must be evaluated through multi-criteria approaches such as the RASE (Reliability-Affordability-Sustainability-Equity) framework
5. Policymakers must implement reforms spanning regulation, incentives, institutional capability, decentralisation clarity, and long-term anticipatory governance

Summary

Indonesia is a major fossil-fuel economy. CCS is an important stop-gap measure for countries where a rapid shift to zero carbon technology is less feasible, such as Indonesia. Deployment of CCS in Indonesia has been hindered by the absence of clear regulation, weak policy capacity and misalignment between governance modes and governance competencies. While Presidential Regulation No. 14/2024 is a milestone toward clarity on permitting, liability and monitoring, gaps remain in operational guidance, financial mechanisms, and carbon price signals.

What's the issue?

Indonesia is the 8th largest global emitter of greenhouse gases, particularly methane and carbon dioxide. Energy supply is dominated by coal (60%) and gas (20%)¹.

The fossil sector provides significant employment and contributes billions in export

revenue. However, the financial system is highly exposed to transition risk, with nearly a third of bank lending linked to high-emitting sectors², Indonesia's sustainable finance taxonomy³ includes a yellow (transitional) category, allowing certain fossil-linked activities to be treated as "in transition" if they

¹ International Energy Agency. 2022. Enhancing Indonesia's Power System. August 11, 2022.

<https://www.iea.org/reports/enhancing-indonesias-power-system>

² Balzer, James. 2023. "Developing Sustainable Finance for a Net Zero Indonesia – Opportunities and Challenges." Illuminem, August 23, 2023.

³ Indonesia Financial Services Authority. 2025. *Indonesia Taxonomy for Sustainable Finance Version 2*. February 2025.

avoid significant harm⁴. This transitional category is also reflected in the ASEAN sustainable finance taxonomy⁵. Critics caution that the category risks legitimising continued fossil investment unless paired with stringent abatement requirements and credible transition pathways.

CCS is crucial for supporting grid reliability, affordability, sustainability, and equity in the transition, dimensions articulated through the RASE framework. However, the governance system responsible for enabling CCS is neither aligned nor equipped to deliver credible outcomes.

Regarding first order governance failures (the misalignment between CCS incentive structures and governance modes) there are four key issues:

Unclear fiscal incentives - The absence of clear tax credits, revenue guarantees, or support mechanisms increases financing costs and slows momentum for first-of-kind projects.

Absence of carbon price signal - Without a meaningful carbon price or Emissions Trading System (ETS), there is no regulatory demand for emissions reductions equivalent to the cost of CCS deployment. This weakens industry motivation to adopt high-capex abatement technologies, especially when cheaper, high-emitting options remain financially attractive.

The risk of premature “lock in” of early regulatory design - Rigid codification of immature regulatory approaches risks locking the system into suboptimal or inefficient governance modes. This can hinder future

policy adaptation, especially as CCS technologies evolve rapidly and regional CO₂ storage markets emerge.

Overly vague regulation - PR 14/2024 leaves critical details such as Measurement, Reporting, and Verification (MRV) protocols, CO₂ ownership, and liability transfer unresolved. As a result, developers remain uncertain about compliance and long-term responsibilities. Projects cannot move forward due to missing operational guidance.

Regarding second-order governance failures (insufficient governance capacity to implement the required governance mode) Indonesia faces three challenges:

Limited technical capacity in ministries - Ministries lack sufficient expertise in CCS engineering, reservoir analysis, and long-term monitoring. This limits their ability to evaluate proposals, assess geological integrity, and supervise industry effectively.

Absence of a dedicated CCS authority - Unlike the UK or Norway, Indonesia lacks a specialised regulator or agency solely for CCS oversight. Responsibility is spread across multiple ministries and SKK Migas, causing unclear accountability and fragmented administrative pathways.

Siloed industrial, climate and energy policymaking - CCS requires coordination across climate targets, industrial policy, and energy planning. However, these areas often operate in isolation, resulting in policies that do not reinforce each other. This fragmentation increases transaction costs and delays the development of CCS cluster strategies.

⁴ Ng, Christina. 2022. “Indonesia’s Green Taxonomy Walks on a Tightrope in Balancing Industries of the Past and the Future.” *Institute for Energy Economics and Financial Analysis (IEEFA)*, May 11, 2022. <https://ieefa.org/resources/indonesias-green-taxonomy-walks-tightrope-balancing-industries-past-and-future>

⁵ ASEAN Taxonomy Board. 2025. *ASEAN Taxonomy for Sustainable Finance Version 4*. November 6, 2025. https://www.theacmf.org/images/downloads/pdf/ASEAN%20Taxonomy%20Sustainable%20Finance%20V4_06Nov25.pdf.

Why is this important?

Indonesia cannot decarbonise heavy industry or fossil-based baseload generation at sufficient speed without CCS. CCS provides a transitional bridge that can enable net-zero pathways, provided that it is governed effectively and does not entrench carbon-dependent systems.

Presidential Regulation No. 14/2024 sets the foundation but leaves operational gaps.

PR 14/2024 establishes two distinct permitting tracks: CCS within oil and gas Working Areas under Cooperation Contracts, and CCS outside these areas through Exploration and Storage Operation Permits within designated Carbon Storage Permit Areas, or Wilayah Izin Penyimpanan Karbon, (WIPK). This provides, for the first time, a clear procedural route for industrial CCS operators beyond the upstream sector. The Regulation also introduces auction and limited-selection mechanisms for allocating WIPK and clarifies the sequence from exploration to operational approval. The Regulation also defines responsibilities throughout the CCS lifecycle, covering storage integrity, emergency response, and leakage rules for cross-border CO₂ transport. Liability is allocated among emitters, transport permit holders, and storage operators based on the location of incidents. While this provides a necessary legal basis for risk allocation, additional operational guidance remains necessary.

Operators must conduct continuous monitoring of CCS sites from approval through 10 years after closure, including MRV of emissions reductions and safety monitoring of injection zones. They must maintain a government-approved monitoring plan and submit periodic reports to the Ministry of Energy and Mineral Resources (MEMR). These provisions expand the state's oversight role and create

substantial capacity demands for both operators and regulators.

SKK Migas maintains authority over CCS activities within oil and gas Cooperation Contract areas, including the review of CCS plans and the approval of storage capacity assessments. This framework ensures continuity with established upstream governance and broadens SKK Migas's mandate to include subsurface carbon storage. The Regulation further allows for the reassignment of unused subsurface potential in oil and gas blocks as WIPK, a process coordinated by SKK Migas.

PR 14/2024 also provides legal recognition for multiple storage types: depleted reservoirs, saline aquifers, and coal seams. It codifies acceptable capture technologies, including direct air capture and oxy-fuel combustion. The regulation also establishes carbon transport permitting for pipelines, trucks, and ships, with exemptions for transport within or between Working Areas. Together, these provisions form the backbone of Indonesia's CCS governance system.

However, there are numerous oversights in the regulation.

While the Regulation confirms that CCS-related upstream assets become state property, it does not address long-term ownership or liability for stored CO₂. This lack of clarity complicates insurance, financing and cross-border arrangements. Investors need clearer stewardship provisions before committing to large-scale projects.

While PR 14/2024 mandates MRV as an obligation, it leaves the technical methodologies undefined. Without detailed protocols aligned with international standards, Indonesia risks inconsistencies in

emissions reporting and weak credibility in carbon accounting. This also limits interoperability with future bilateral agreements for cross-border CO₂ transport.

Likewise, the Regulation permits storage fees and government royalties but does not specify fiscal tools like tax credits, guaranteed tariffs, or viability-gap funding. Since CCS projects in Indonesia require significant capital, the lack of clear incentives could delay early development. Investors are likely to look for stable pricing and long-term revenue certainty before making final decisions.

Finally, the Regulation operates in parallel to, but not integrated with, Indonesia's emerging carbon tax and future ETS mechanisms. This weak alignment means CCS is not yet embedded into national decarbonisation pathways predictably. Stronger linkage would accelerate demand for CCS services and support the economics of domestic and regional storage markets.

What should the policymakers do?

1. Strengthen and operationalise Presidential Regulation No. 14/2024.

To transition the regulation from framework-level guidance to effective implementation, policymakers should establish a national CCS regulatory authority with powers akin to the UK's North Sea Transition Authority. This authority should have the mandate to oversee all aspects of CCS project approval, development, and operation, ensuring robust enforcement and sector-wide coordination. It should also facilitate industry engagement and provide clarity on regulatory processes to attract investment.

Likewise, it would be prudent to publish detailed implementing guidelines, including CO₂ ownership rules, injection testing requirements, and long-term stewardship financing mechanisms. These guidelines should clarify the legal responsibilities of project developers, outline technical standards for site selection and monitoring, and specify financial assurance requirements for post-closure care. Clear, comprehensive guidance will reduce regulatory uncertainty

and support consistent project execution. This would be reinforced by introducing mandatory MRV standards aligned with ISO norms and international CCS regulators. These standards should require rigorous measurement, reporting, and verification of CO₂ quantities captured, transported, and stored, and mandate regular third-party audits. Alignment with global best practices will ensure transparency, build stakeholder confidence, and enable cross-border project compatibility.

Finally, Indonesian regulation should embed CCS within a broader carbon pricing and ETS pathway, including phase-in plans for industrial emitters. Integrating CCS into carbon-pricing mechanisms will create market incentives for emissions abatement and encourage private sector participation. A phased approach should provide a clear timeline for compliance, allowing industries to adapt while supporting Indonesia's net-zero targets.

This directly addresses first-order failures related to misaligned governance modes.

2. Build analytical, managerial, and monitoring capacity across all levels of government

To address second-order failures, Indonesia should create a national CCS Centre of Excellence to train public administrators in subsurface mapping, geology, reservoir management, and MRV. To support this, Indonesia should establish provincial CCS technical units to support permitting and environmental assessment.

Implementing inter-ministerial coordination mechanisms could address fragmentation between climate, energy, and industrial ministries. The support of local and municipal governments through long-term staffing budgets would also be prudent.

3. Establish clear and durable economic incentives for CCS deployment

These incentives should be designed to ensure long-term investment certainty and signal government commitment to CCS as a critical decarbonisation technology. Options could include guaranteed price support, contractual revenue guarantees, or dedicated funding streams to bridge the cost gap for early-stage projects.

Developing a roadmap for expanding the national carbon tax beyond coal-fired plants would support this. This roadmap should set clear timelines and sectoral milestones for the inclusion of additional industries, such as cement, steel, and petrochemicals. It should also outline mechanisms for gradual implementation, stakeholder engagement, and integration with Indonesia's broader climate policy framework.

Introducing tax credits, accelerated depreciation and viability-gap funding for CCS investment is advisable. These financial instruments will lower the upfront cost burden on project developers and help mobilise private capital for large-scale deployment. In addition, targeted support for demonstration and first-mover projects can accelerate technology learning and drive down future costs.

Enabling public-private risk-sharing mechanisms, including blended finance and insurance-backed guarantees, would help mitigate investment risks associated with new CCS projects, making them more attractive to both domestic and international investors. Coordinated risk-sharing frameworks can also facilitate access to concessional finance and ensure project bankability.

Ensuring that Indonesia's Sustainable Finance Taxonomy ties transitional categories to verified abatement outcomes to prevent greenwashing would de-risk reputational concerns. Effective monitoring and reporting standards should be implemented to track emissions reductions and ensure that transitional finance supports genuine decarbonisation. This will boost investor confidence and uphold the integrity of Indonesia's sustainable finance system.

4. Clarify decentralisation responsibilities for CCS permitting and monitoring.

Decentralisation tensions contribute to imposed and reluctant inaction. Indonesia should define clear divisions of labour between national, provincial and municipal bodies for CCS oversight.

Shared accountability and performance frameworks for cross-regional CCS clusters

and expanding budget transfers for local governments tasked with CCS permitting and monitoring, would de-silo governance, reduce regulatory duplication and enhance policy capacity at municipal and local governments.

5. Embed RASE-aligned, long-term, anticipatory governance in CCS strategy

These include using scenario planning to assess the long-term implications of CCS on reliability, affordability, sustainability and equity.

Indonesia must ensure CCS governance supports, but does not crowd out, long-term renewable energy development.

Embedding social licence and community engagement processes in early CCS design is also recommended.

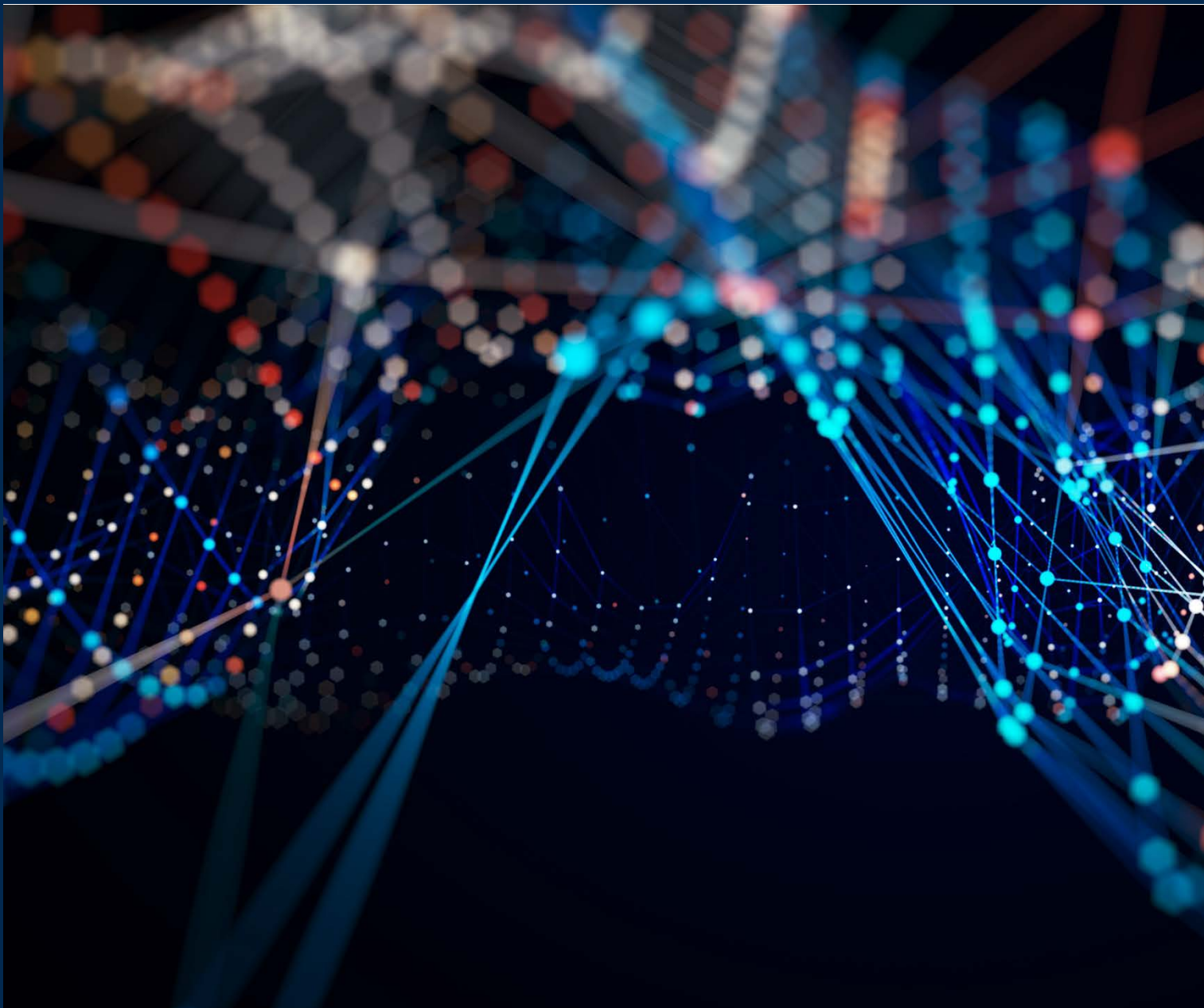
Biography

James Balzer is an Australian strategic foresight practitioner specialising in governance innovation for climate and sustainability policy. He has led major energy transition programmes in Australia, contributed to UN and multilateral initiatives, and lectures on sustainability reform across Asia. His work has been recognised by the World Economic Forum and published globally.



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