



Sustainability Disclosure Maturity in Indonesian Banking: A Comparative Content Analysis

Anggun Wida Prawira^{1*}, Hasan Ahmad², Kinza Kanwal³

¹ Universitas Dr. Soetomo Surabaya, Indonesia

² London Academy for Applied Technology, United Kingdom

National Defence University, Pakistan

email: awprawira21@gmail.com¹

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Abstract

Sustainability reporting in banking has shifted from narrative corporate responsibility toward quantified climate risk, financed emissions, and portfolio-level transition metrics. This study examined 2024 sustainability disclosures of Bank Central Asia, Bank Rakyat Indonesia, Bank Mandiri, and Bank Negara Indonesia using comparative quantitative content analysis. A coding framework covered regulatory alignment, international reporting standards, climate-risk architecture, financed-emissions methodology, portfolio coverage, target setting, and external assurance. All four reports combined Indonesian sustainable-finance requirements with international reporting frameworks, while the depth of climate metrics varied by institution. Bank Mandiri reported 19.4 million tCO₂e of financed emissions and expanded loan-asset coverage from 44.4% to 56.1%; BNI reported PCAF-based coverage of 70.3% of specified productive loan portfolios; BCA disclosed 37.43 million tCO₂e of financed emissions; and BRI reported declining operational Scope 1 and 2 emissions alongside PCAF-based financed-emission measurement. The findings showed that disclosure maturity increasingly depended on portfolio coverage, methodological transparency, comparability, and assurance rather than document length. The study proposed a practical evidence chain linking reported standards, quantified exposure, transition targets, and verification.

Keywords: *Banking, Climate Disclosure, Financed Emissions, Indonesia, Sustainability Reporting.*



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INTRODUCTION

Banks occupy a distinctive position in sustainability reporting because the environmental footprint associated with lending and investment can materially exceed emissions generated by branches, offices, and data centers. This has moved climate disclosure beyond operational energy management toward the measurement of financed emissions, sector exposure, transition plans, and credit-risk integration. The Partnership for Carbon Accounting Financials (PCAF, 2022) provides a standardized method for attributing greenhouse-gas emissions to financial institutions, while the Task Force on Climate-related Financial Disclosures (TCFD, 2017) organized climate reporting around governance, strategy, risk management, and metrics and targets. More recently, IFRS S1 and IFRS S2 established a global baseline for investor-focused sustainability and climate-related financial disclosure (IFRS Foundation, 2023a; IFRS Foundation, 2023b). These developments create a more demanding evidence environment in which narrative commitments are expected to connect with quantified exposures and decision-useful methodology.

Indonesia's regulatory architecture has developed in parallel. Financial Services Authority Regulation No. 51/POJK.03/2017 introduced sustainable-finance obligations for financial services institutions and public companies, while Circular Letter No. 16/SEOJK.04/2021 provided sustainability-reporting guidance for issuers and public companies (OJK, 2017; OJK, 2021). The 2024 Climate Risk Management and Scenario Analysis guidance added a more explicit risk-management dimension for the banking sector (OJK, 2024). These national requirements interact with international standards rather than operating as separate systems. Banks commonly cite Global Reporting Initiative standards for impact-oriented reporting, Sustainability Accounting Standards Board metrics for industry-specific investor information, and climate frameworks for financed-emission or scenario analysis (GRI, 2021; SASB, 2018). The analytical problem is to determine how these multiple frameworks are translated into measurable, comparable disclosure practices.

Sustainability disclosure research shows that the existence of a report does not guarantee decision usefulness. Adams (2017) argues that integrated thinking and accountability require organizations to connect sustainability information with governance and strategy rather than treating it as a communication exercise. Christensen et al. (2021) show that mandatory sustainability reporting can improve information environments while also producing implementation and comparability challenges. Amel-Zadeh and Serafeim (2018) find that investors use environmental, social, and governance information for several purposes, including risk assessment and investment analysis, but data quality remains a central concern. Divergence among ESG ratings documented by Berg et al. (2022) further illustrates how differences in scope, measurement, and weighting can produce inconsistent assessments. In banking, these concerns make methodology and portfolio coverage at least as important as the number of reported indicators.

Climate exposure introduces a further layer of materiality. Krueger et al. (2020) show that institutional investors view climate risks as financially relevant, while Bolton and Kacperczyk (2021) document a carbon premium in equity markets. Matsumura et al. (2014) find capital-market consequences associated with carbon emissions and disclosure, demonstrating that quantified emissions can carry valuation relevance. Corporate sustainability research also suggests that governance and material sustainability practices can be associated with long-term performance and resilience (Eccles et al., 2014; Khan et al., 2016). For banks, the practical implication is that portfolio climate metrics should increasingly be read as risk information rather than solely as social-responsibility indicators. This makes financed-emission accounting, sector intensity, coverage, and target pathways critical elements of disclosure maturity.

The four major Indonesian banks examined in this study provide a useful comparative setting because each publishes a dedicated sustainability report but emphasizes somewhat different measurement architectures. BCA's 2024 reporting refers to Indonesian regulation, GRI, SASB, and sustainable-banking assessment frameworks and reports financed emissions of 37.43 million tCO₂e (BCA, 2025). BRI reports PCAF-based financed-emission measurement and operational Scope 1 and 2 emissions, with operational emissions declining from 492,370 tCO₂e in 2022 to 470,508 tCO₂e in 2024 (BRI, 2025). Bank Mandiri reports detailed financed-emission coverage, absolute emissions, intensity, asset-class composition, and climate-risk management metrics (Bank Mandiri, 2025). BNI reports PCAF adoption, 70.3% coverage of specified productive loan portfolios, climate-resilience disclosures, and independent assurance over selected sustainability information (BNI, 2025).

Prior empirical research provides several ways to interpret these disclosures. Broadstock et al. (2021) show that ESG performance can be associated with resilience during periods of market stress, while Albuquerque et al. (2020) find that environmental and social characteristics were linked with stock performance during the COVID-19 shock. Gillan et al. (2021) review the relationship between ESG and corporate finance, emphasizing the importance of measurement and causal interpretation. Pedersen et al. (2021) describe ESG-efficient portfolio construction as a problem of balancing sustainability signals with risk and return, while Gibson Brandon et al. (2022) show that investor disagreement about ESG can affect market outcomes. Fatemi et al. (2018) similarly report that ESG activities and disclosure interact in firm valuation. These studies reinforce the need to distinguish disclosure presence from disclosure quality and comparability.

This study examined sustainability disclosure maturity through a content-based evidence chain rather than a reputational ranking of banks. The research asked how four 2024 sustainability reports combined regulatory and international frameworks, how deeply they quantified climate-related banking exposures, and which features increased the auditability and comparability of disclosed information. Maturity was operationalized as the progression from stated frameworks and policies toward quantified operational metrics, financed-emission methodology, portfolio coverage, transition targets, and external verification. The analysis did not infer actual environmental performance from disclosure volume and did not treat different absolute financed-emission totals as directly comparable where portfolio boundaries differed. This distinction follows the measurement caution in Berg et al. (2022) and the wider disclosure literature.

RESEARCH METHODS

The study used comparative quantitative content analysis of the English-language 2024 sustainability reports issued by PT Bank Central Asia Tbk, PT Bank Rakyat Indonesia (Persero) Tbk,

PT Bank Mandiri (Persero) Tbk, and PT Bank Negara Indonesia (Persero) Tbk. Reports were treated as the primary unit of analysis because they provide institutionally approved disclosures for the same reporting year. Coding covered seven evidence categories: national regulatory reference, GRI-based reporting, industry-specific sustainability standards, climate-risk framework, financed-emission methodology, portfolio-coverage or intensity metrics, and independent assurance. The categories were selected from the reporting architecture established by OJK (2017, 2021, 2024), GRI (2021), SASB (2018), TCFD (2017), IFRS Foundation (2023a, 2023b), and PCAF (2022).

Quantitative extraction focused on values that were explicitly stated in the reports and could be reproduced without estimating missing figures. For Bank Mandiri, extracted indicators included 2024 financed emissions of 19.4 million tCO₂e, loan-asset emissions of 15.6 million tCO₂e, other-asset emissions of approximately 3.8 million tCO₂e, loan-portfolio coverage of 56.1% or Rp609.2 trillion, and financed-emission intensity of 26.4 tCO₂e per Rp billion (Bank Mandiri, 2025). For BNI, the analysis used the reported PCAF coverage of 70.3% of the Corporate, International, Enterprise, Commercial, and Retail Productive loan segments, compared with 67.9% in the preceding year (BNI, 2025). BCA's reported financed emissions of 37.43 million tCO₂e and BRI's operational Scope 1 and 2 values were retained as institution-specific indicators rather than normalized cross-bank performance measures (BCA, 2025; BRI, 2025).

The interpretive framework separated disclosure maturity from environmental performance. A bank could disclose a higher absolute level of financed emissions because it measured a broader portfolio, used different asset classes, or improved data coverage; the number alone was not coded as better or worse performance. Instead, analytical emphasis was placed on whether the report explained boundaries, methodology, data quality, portfolio coverage, target logic, and assurance. This approach is supported by accounting research showing that sustainability information becomes more useful when scope and measurement choices are transparent (Christensen et al., 2021; Amel-Zadeh & Serafeim, 2018). It also reflects PCAF's data-quality logic and the need for consistent attribution methods in financial-sector emissions accounting (PCAF, 2022).

The study did not independently assure the reported metrics, reconstruct loan-level emissions, or test the financial effect of sustainability disclosure. External-assurance statements were coded as evidence that a third party had reviewed defined sustainability information, not as proof that every disclosed number had been verified. Literature on sustainable finance and valuation was used to interpret why comparable climate information may matter to investors and risk managers (Krueger et al., 2020; Gillan et al., 2021; Pedersen et al., 2021; Gibson Brandon et al., 2022). The method is therefore best understood as an analysis of public reporting architecture and evidence quality, not as an environmental ranking or causal test of bank performance.

RESULTS AND DISCUSSION

Reporting architecture and the shift toward decision-useful climate evidence

All four banks combined Indonesian sustainability-reporting obligations with international frameworks, confirming that the reporting architecture is multi-standard rather than purely domestic. Table 1 records the principal frameworks explicitly referenced in the reviewed materials. BCA aligned its report with POJK requirements and used GRI, SASB, and the WWF Sustainable Banking Assessment among its references; BRI combined GRI and banking metrics with climate and financed-emission frameworks; Bank Mandiri integrated GRI, SASB, PCAF, TCFD-related disclosure, and OJK climate-risk management; and BNI used GRI, banking-sector sustainability metrics, SUSBA, and assurance criteria (BCA, 2025; BRI, 2025; Bank Mandiri, 2025; BNI, 2025). The common feature is not identical framework selection but a movement toward multiple audiences: regulators, investors, civil society, and climate-risk users.

Table 1. Reporting Architecture Identified in 2024 Sustainability Reports

Bank	Selected reporting or assessment frameworks explicitly referenced	Climate-accounting evidence
BCA	POJK/SEOJK; GRI; SASB; WWF SUSBA	Financed emissions; climate and environmental-social risk metrics; assurance
BRI	POJK/SEOJK; GRI; SASB; TCFD/IFRS climate references; PCAF	Operational emissions; financed-emission method; sector pathways; assurance
Bank Mandiri	POJK/SEOJK; GRI; SASB; TCFD; PCAF; OJK CRMS	Asset-class financed emissions; coverage; intensity; climate-risk metrics
BNI	POJK/SEOJK; GRI; GRI financial supplement; SASB; SUSBA; PCAF	Financed-emission coverage; climate resilience; external assurance

Source: Banks' 2024 sustainability reports.

The use of several standards can improve information richness but also creates a risk of reporting density without analytical coherence. GRI (2021) emphasizes impacts on the economy, environment, and people, while SASB (2018) is structured around industry-specific financially material information. IFRS S1 and S2 further emphasize investor-useful sustainability-related financial information and climate-related risks and opportunities (IFRS Foundation, 2023a; IFRS Foundation, 2023b). A mature report therefore needs to explain how these standards connect instead of presenting separate indexes that duplicate indicators. The reviewed banks increasingly organize climate reporting around governance, strategy, risk, and metrics, which resembles the architecture first popularized by TCFD (2017). This convergence improves navigability even when terminology and indicator boundaries differ.

Financed-emission disclosure is the clearest marker of the shift from operational corporate responsibility toward balance-sheet relevance. BCA reported 37.43 million tCO₂e of financed emissions for 2024, while Bank Mandiri reported 19.4 million tCO₂e across reported loan and other asset classes (BCA, 2025; Bank Mandiri, 2025). These absolute values should not be compared as if the lower number represented superior performance because the underlying portfolios, asset classes, reporting boundaries, and data coverage differ. PCAF (2022) explicitly requires institutions to disclose methodological boundaries and data-quality considerations. The more informative maturity question is whether the institution identifies the covered portfolio, attribution approach, data source, quality limitations, and year-on-year changes. Bank Mandiri's report is especially detailed on coverage and intensity, illustrating how absolute emissions become more interpretable when paired with denominator and boundary information.

BRI's disclosure illustrates another maturity pathway: combining operational emissions with financed-emission methodology. The bank reported Scope 1 and 2 operational emissions of 492,370 tCO₂e in 2022, 486,352 tCO₂e in 2023, and 470,508 tCO₂e in 2024, while also explaining its participation in PCAF and the use of PCAF methodology for financed emissions (BRI, 2025). Figure 1 shows the operational trend without implying that operational emissions represent the bank's full climate footprint. The decline is useful as an internal performance indicator, but financed emissions remain more material to the climate consequences of banking portfolios. This distinction mirrors Bolton and Kacperczyk (2021) and Matsumura et al. (2014), whose research demonstrates why carbon exposure can have financial relevance when markets price climate-related information.

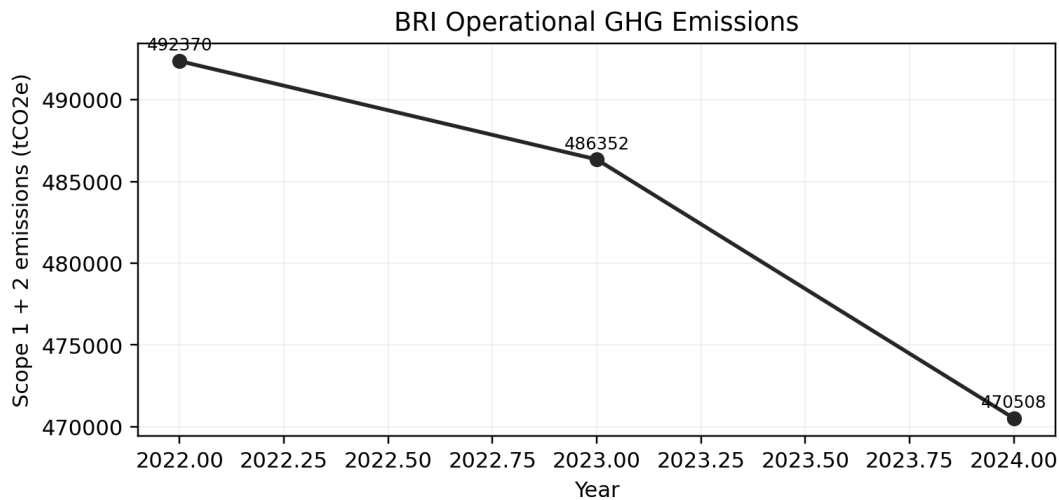


Figure 1. BRI Operational Scope 1 and 2 Emissions, 2022–2024

BNI's 2024 report emphasizes expansion of PCAF-based coverage to 70.3% of specified productive loan portfolios, up from 67.9% in 2023 (BNI, 2025). Coverage growth is an important disclosure-quality indicator because financed-emission estimates become more representative as more of the relevant balance sheet is measured. A rising coverage rate may also increase absolute reported emissions even when underlying clients decarbonize, which is another reason absolute totals should not be interpreted in isolation. The report links coverage expansion with climate-resilience management and a target structure for operational and financing net-zero pathways. This design reflects a broader trend in sustainable finance: the analytical unit is moving from corporate operational footprint to financed counterparties and sector transition, consistent with PCAF (2022) and UNEP FI (2019).

External assurance adds a separate dimension of credibility. BNI's report includes an independent assurance statement applying defined assurance procedures to report content and selected material topics, while BCA and BRI also disclose external assurance arrangements in their sustainability-reporting process (BNI, 2025; BCA, 2025; BRI, 2025). Assurance does not eliminate estimation uncertainty, especially for financed emissions that depend on counterparties and modeled data, but it increases procedural accountability. Adams (2017) argues that credible sustainability reporting requires governance and accountability structures around the information-generation process. Christensen et al. (2021) similarly note that mandated sustainability reporting can produce benefits only when implementation quality and enforcement support comparability. The presence of assurance is therefore best read alongside scope, assurance level, and the specific indicators covered.

The framework matrix also shows that banks are increasingly using climate-risk information in credit and portfolio governance rather than keeping it within sustainability teams. OJK's 2024 climate-risk management guidance encourages scenario analysis and integration into banking risk processes (OJK, 2024). Bank Mandiri reports use of OJK climate-risk management guidance alongside PCAF and sector analysis, while BRI discusses sectoral decarbonization approaches and financed-emission measurement (Bank Mandiri, 2025; BRI, 2025). Krueger et al. (2020) show that institutional investors consider climate risk financially material, supporting this integration between sustainability and conventional risk management. The reporting implication is that decision-useful climate disclosure should increasingly explain how metrics influence lending, limits, engagement, or scenario analysis rather than only presenting end-of-year numbers.

A second reporting-quality issue is the relationship between sustainability labels and measurable portfolio data. The banks disclose sustainable-finance or green-portfolio categories, yet classification totals can be difficult to compare when taxonomies, product definitions, and reporting boundaries differ. WWF (2024) and UNEP FI (2019) encourage banks to connect environmental and social commitments with portfolio policies and measurable targets. Research by Fatemi et al. (2018) and Broadstock et al. (2021) also indicates that sustainability information becomes more economically informative when it is specific enough to distinguish substantive performance from general reputation. The reviewed reports

show progress toward such specificity through financed-emission and climate-risk metrics, although cross-bank comparability remains constrained by methodological variation.

The first major result is therefore a transition from compliance-oriented sustainability reporting toward a layered evidence architecture. The reports no longer rely solely on community programs or operational resource consumption; they increasingly connect national regulation, international standards, financed emissions, climate-risk methods, and assurance. This pattern is consistent with the evolution of investor demand described by Amel-Zadeh and Serafeim (2018) and the corporate-finance literature reviewed by Gillan et al. (2021). Disclosure maturity in this setting is best understood as traceability: a reader should be able to move from a stated framework to a quantified metric, understand the measurement boundary, locate the target or risk response, and identify whether the information received independent review.

Financed-emission coverage, comparability, and portfolio transition signals

Bank Mandiri provides a detailed example of why coverage is essential to interpreting financed emissions. Its 2024 report states that loan-asset coverage reached 56.1% of the bank's loan portfolio, equivalent to Rp609.2 trillion, compared with 44.4% in the preceding reporting basis (Bank Mandiri, 2025). The bank reported total financed emissions of 19.4 million tCO₂e, comprising 15.6 million tCO₂e from loan assets and approximately 3.8 million tCO₂e from other assets. The reported intensity declined from 31.83 to 26.40 tCO₂e per Rp billion while absolute emissions increased, a combination that cannot be understood without the concurrent expansion in coverage. Table 2 reproduces these related indicators as an example of internally coherent disclosure rather than as a benchmark for other banks.

Table 2. Selected Bank Mandiri Financed-Emission Indicators, 2024

Indicator	2023/baseline comparator	2024 reported value
Loan-asset portfolio coverage	44.4%	56.1% (Rp609.2 trillion)
Total financed emissions	18.1 million tCO ₂ e	19.4 million tCO ₂ e
Loan-asset financed emissions	13.5 million tCO ₂ e	15.6 million tCO ₂ e
Other-asset financed emissions	4.6 million tCO ₂ e	3.8 million tCO ₂ e
Financed-emission intensity	31.83 tCO ₂ e/Rp billion	26.40 tCO ₂ e/Rp billion

Source: Bank Mandiri Sustainability Report 2024.

The Mandiri pattern illustrates a general measurement principle: changes in financed emissions reflect at least three forces—portfolio exposure, client emissions, and measurement coverage. An institution can report a higher absolute number because it financed more activity, because counterparties emitted more, or because the bank captured more of the portfolio with better data. PCAF (2022) addresses this problem by requiring asset-class attribution and data-quality disclosure. A useful year-on-year narrative should therefore reconcile these forces instead of describing absolute movement alone. This is especially important during the first years of financed-emission reporting, when institutions are expanding data coverage and switching from proxies to client-reported information. Without such reconciliation, users can mistake improved measurement for deteriorating climate performance or overlook deterioration hidden by shrinking coverage.

BNI's increase in PCAF-based coverage from 67.9% to 70.3% offers a second example of coverage as a maturity signal (BNI, 2025). The disclosure explicitly links the 2024 calculation to Corporate, International, Enterprise, Commercial, and Retail Productive portfolios. Figure 2 places BNI's coverage change beside Bank Mandiri's reported coverage expansion, but the figure does not compare the banks' absolute performance because their denominators are not identical. The purpose is

to show a common direction of travel: banks are attempting to measure a larger share of their financing activities. This is methodologically important because the credibility of transition targets depends on whether the baseline represents a sufficiently broad and stable portion of the portfolio.

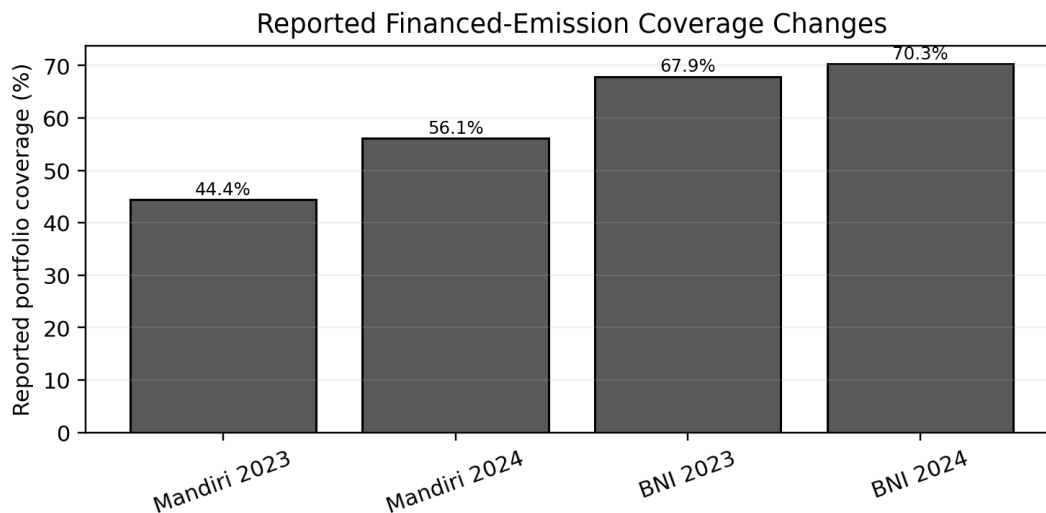


Figure 2. Reported Financed-Emission Coverage Changes

BCA's financed-emission total of 37.43 million tCO₂e demonstrates the same need for boundary-aware reading. The bank explains that financed emissions are calculated in relation to sectoral loan exposure and uses the metric to support analysis of carbon-related risks and transition opportunities (BCA, 2025). The number is materially larger than Bank Mandiri's reported total, but a direct performance comparison would be unsound without harmonized asset classes, client data, baseline year, and coverage. Berg et al. (2022) show how divergent measurement choices can produce substantial disagreement in ESG assessments, and the same logic applies to carbon-accounting comparisons. Cross-bank analysis should therefore prioritize normalized and methodologically aligned metrics only after confirming common boundaries.

BRI's disclosure adds sector-decarbonization information to the evidence chain. The bank reports PCAF participation, sector-specific financed-emission measurement, and reduction pathways for selected sectors while operational Scope 1 and 2 emissions also declined through 2024 (BRI, 2025). This combination matters because portfolio transition cannot be inferred from a single institution-wide intensity figure. Sector pathways allow users to distinguish changes driven by electricity generation, property, pulp and paper, or other activities with different transition technologies and time horizons. The approach is consistent with the financial-materiality logic of IFRS S2, which expects climate information to be connected to risks and opportunities that could affect enterprise prospects (IFRS Foundation, 2023b). More granular sector disclosure also helps credit committees link sustainability metrics with conventional portfolio concentration and scenario analysis.

Target credibility depends on the relationship between baseline, pathway, portfolio action, and governance. A net-zero target stated without a measured baseline offers limited information about implementation, while a quantified baseline without a target does not reveal strategic direction. The reviewed reports increasingly combine both elements, although target scopes and time horizons vary (BCA, 2025; BRI, 2025; Bank Mandiri, 2025; BNI, 2025). UNEP FI (2019) frames responsible banking around alignment of strategy and portfolio impacts, and PCAF (2022) provides the accounting foundation needed to monitor that alignment. Eccles et al. (2014) and Khan et al. (2016) similarly show why material sustainability practices are most relevant when embedded in organizational processes rather than isolated disclosure activities.

The capital-market literature helps explain why this evolution matters even when the study does not test valuation effects. Albuquerque et al. (2020) find that firms with stronger environmental and social characteristics showed differential stock performance during the COVID-19 crisis, while Broadstock et al. (2021) report evidence of ESG-related resilience. Pedersen et al. (2021) conceptualize ESG information as an input into portfolio optimization, and Gibson Brandon et al. (2022) show that

disagreement about ESG can itself affect market behavior. Better banking disclosures can therefore reduce one source of disagreement by clarifying definitions, boundaries, and methodologies. They cannot eliminate uncertainty because climate scenarios and financed-emission estimates remain model-dependent, but they can make uncertainty visible and auditable.

A practical disclosure evidence chain emerges from the four-bank comparison. First, the report should identify the regulatory and reporting standards used; second, it should state the portfolio boundary and emission methodology; third, it should quantify absolute exposure and, where meaningful, intensity or coverage; fourth, it should connect the metric to targets, sector pathways, or risk controls; fifth, it should explain data quality and methodological change; and sixth, selected information should be subject to external assurance where feasible. Table 3 summarizes this sequence. The chain responds to the credibility concerns in Christensen et al. (2021) and Adams (2017) and provides a more useful maturity lens than counting disclosure pages or keywords.

Table 3. Evidence Chain for Mature Banking Sustainability Disclosure

Stage	Evidence expected	Reason for analytical value
Framework	Applicable regulation and reporting standards	Clarifies reporting basis and intended audience
Boundary	Asset classes, sectors, entities, coverage denominator	Defines what the metric represents
Measurement	Absolute emissions, intensity, data-quality method	Makes climate exposure quantifiable
Transition	Targets, sector pathways, scenario or risk linkage	Connects measurement with management action
Reconciliation	Restatements, methodology changes, coverage changes	Supports year-on-year interpretation
Verification	Assurance scope and level	Adds procedural credibility to selected information

Source: Authors' synthesis of the reports.

The study is limited by reliance on public reports and by differences in portfolio structure, terminology, and data boundaries. It does not test whether disclosed climate strategies changed lending decisions, borrower emissions, or financial performance, and it does not independently verify reported values. Comparability will improve only if institutions continue to disclose stable coverage denominators, asset-class methods, restatements, and reasons for year-on-year change. The available evidence nonetheless shows a clear development in Indonesian banking disclosure: 2024 reports contain increasingly technical financed-emission and climate-risk information that can support analysis beyond traditional corporate-responsibility narratives. The next stage of maturity will depend on consistent time series, broader portfolio coverage, transition-plan accountability, and assurance over the metrics most relevant to financed climate exposure.

CONCLUSION

The 2024 sustainability reports of BCA, BRI, Bank Mandiri, and BNI show that Indonesian banking disclosure is moving toward a more technical climate-accounting architecture. National sustainable-finance requirements are combined with international standards, financed-emission methodologies, climate-risk tools, portfolio coverage measures, and external assurance. The most informative disclosures connect absolute emissions with boundaries, intensity, data coverage, sector pathways, and methodological explanation. This evidence chain is more useful for assessing disclosure maturity than document length or the isolated presence of ESG terminology.

Cross-bank comparison remains constrained because financed-emission totals are not automatically comparable across different portfolios and coverage assumptions. Future studies should

construct harmonized multi-year panels using stable asset classes, data-quality scores, coverage denominators, and restatement records, then examine whether improvements in disclosure are associated with measurable changes in portfolio composition, climate risk, funding costs, or borrower transition. Independent assurance and transparent methodological reconciliation will be central to that next analytical stage.

REFERENCES

- Adams, C. A. (2017). Conceptualising the contemporary corporate value creation process. *Accounting, Auditing & Accountability Journal*, 30(4), 906–931. <https://doi.org/10.1108/AAAJ-04-2016-2529>
- Albuquerque, R., Koskinen, Y., Yang, S., & Zhang, C. (2020). Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash. *Review of Corporate Finance Studies*, 9(3), 593–621. <https://doi.org/10.1093/rcfs/cfaa011>
- Amel-Zadeh, A., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. *Financial Analysts Journal*, 74(3), 87–103. <https://doi.org/10.2469/faj.v74.n3.2>
- Berg, F., Kölbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, 26(6), 1315–1344. <https://doi.org/10.1093/rof/rfac033>
- Bolton, P., & Kacperczyk, M. (2021). Do investors care about carbon risk? *Journal of Financial Economics*, 142(2), 517–549. <https://doi.org/10.1016/j.jfineco.2021.05.008>
- Broadstock, D. C., Chan, K., Cheng, L. T. W., & Wang, X. (2021). The role of ESG performance during times of financial crisis: Evidence from COVID-19 in China. *Finance Research Letters*, 38, 101716. <https://doi.org/10.1016/j.frl.2020.101716>
- Christensen, H. B., Hail, L., & Leuz, C. (2021). Mandatory CSR and sustainability reporting: Economic analysis and literature review. *Review of Accounting Studies*, 26, 1176–1248. <https://doi.org/10.1007/s11142-021-09609-5>
- Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science*, 60(11), 2835–2857. <https://doi.org/10.1287/mnsc.2014.1984>
- Fatemi, A., Glaum, M., & Kaiser, S. (2018). ESG performance and firm value: The moderating role of disclosure. *Global Finance Journal*, 38, 45–64. <https://doi.org/10.1016/j.gfj.2017.03.001>
- Gibson Brandon, R., Krueger, P., & Schmidt, P. S. (2022). ESG rating disagreement and stock returns. *Financial Analysts Journal*, 78(4), 104–127. <https://doi.org/10.1080/0015198X.2022.2071736>
- Gillan, S. L., Koch, A., & Starks, L. T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, 66, 101889. <https://doi.org/10.1016/j.jcorpfin.2021.101889>
- Global Reporting Initiative. (2021). GRI Universal Standards 2021. GRI.
- IFRS Foundation. (2023a). IFRS S1 General requirements for disclosure of sustainability-related financial information. IFRS Foundation.
- IFRS Foundation. (2023b). IFRS S2 Climate-related disclosures. IFRS Foundation.
- Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate sustainability: First evidence on materiality. *The Accounting Review*, 91(6), 1697–1724. <https://doi.org/10.2308/accr-51383>
- Krueger, P., Sautner, Z., & Starks, L. T. (2020). The importance of climate risks for institutional investors. *Review of Financial Studies*, 33(3), 1067–1111. <https://doi.org/10.1093/rfs/hhz137>
- Matsumura, E. M., Prakash, R., & Vera-Muñoz, S. C. (2014). Firm-value effects of carbon emissions and carbon disclosures. *The Accounting Review*, 89(2), 695–724. <https://doi.org/10.2308/accr-50629>
- Otoritas Jasa Keuangan. (2017). Regulation No. 51/POJK.03/2017 on the implementation of sustainable finance for financial services institutions, issuers, and public companies.
- Otoritas Jasa Keuangan. (2021). Circular Letter No. 16/SEOJK.04/2021 on the form and content of annual reports of issuers or public companies.
- Otoritas Jasa Keuangan. (2024). Climate risk management and scenario analysis guidance for the banking sector. OJK.
- Partnership for Carbon Accounting Financials. (2022). The global GHG accounting and reporting standard for the financial industry: Part A—Financed emissions (2nd ed.). PCAF.

- Pedersen, L. H., Fitzgibbons, S., & Pomorski, L. (2021). Responsible investing: The ESG-efficient frontier. *Journal of Financial Economics*, 142(2), 572–597.
<https://doi.org/10.1016/j.jfineco.2020.11.001>
- PT Bank Central Asia Tbk. (2025). Sustainability report 2024. BCA.
- PT Bank Mandiri (Persero) Tbk. (2025). Sustainability report 2024. Bank Mandiri.
- PT Bank Negara Indonesia (Persero) Tbk. (2025). Sustainability report 2024. BNI.
- PT Bank Rakyat Indonesia (Persero) Tbk. (2025). Sustainability report 2024. BRI.
- Sustainability Accounting Standards Board. (2018). Commercial banks sustainability accounting standard. SASB.
- Task Force on Climate-related Financial Disclosures. (2017). Recommendations of the Task Force on Climate-related Financial Disclosures. Financial Stability Board.
- United Nations Environment Programme Finance Initiative. (2019). Principles for responsible banking. UNEP FI.
- World Wide Fund for Nature. (2024). Sustainable Banking Assessment 2024. WWF.