Cendana International Conference on Social and Technology (CICoST)
CISoST - 2025
E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

Determinants of Corporate Carbon Emission Disclosure: A PRISMA-Based Systematic Literature Review

Daniel Fernando Siahaan[1*], Khaira Amalia Fachrudin[1], Syahyunan[1]

[1] *Faculty of Economics and Business, Universitas Sumatera Utara, Medan, Indonesia*

Email: [1]danielfernandosiahaan@gmail.com
(* : coressponding author)

Abstract

The accelerating climate crisis demands robust corporate transparency through Carbon Emission Disclosure (CED). While scholarly inquiries into CED have expanded markedly, extant investigations remain heavily skewed toward primary carbon-intensive industries such as mining and energy, leaving environmentally sensitive sectors like pharmaceuticals characterized by substantial chemical emissions and hazardous waste streams largely unexamined. This study conducts a Systematic Literature Review (SLR) guided by the PRISMA 2020 framework to synthesize the determinants of CED, focusing on Environmental Management Systems (ISO 14001), Green Investment, and Board Size, alongside the moderating influence of Media Exposure. Following comprehensive multi-database screening across Scopus, Web of Science, and SINTA, 42 peer-reviewed articles published between 2014 and 2025 were synthesized. The findings reveal critical empirical divergence: ISO 14001 certification often reflects symbolic compliance in emerging economies versus substantive performance in developed markets; green investment drives disclosure primarily under supportive market incentives; and board size enhances oversight only when paired with environmental governance competence. Media exposure acts as a potent quasi-moderator reinforcing public legitimacy. Finally, this review articulates an actionable conceptual framework and econometric model tailored for pharmaceutical firms listed on the Indonesia Stock Exchange.

Keyword: Carbon Emission Disclosure, Environmental Management System, Green Investment, Board Size, Media Exposure

1. INTRODUCTION

1.1 Research Background and Climate Imperatives

Anthropogenic climate change represents one of the most consequential systemic risks confronting contemporary financial markets, institutional investors, and global ecosystems. With global average surface temperatures rising approximately 1.1°C above pre-industrial baselines, corporate operations face escalating physical disruptions, asset revaluations, and stringent decarbonization mandates. Under the auspices of the Paris Agreement, sovereign signatories have established increasingly ambitious Nationally Determined Contributions (NDCs). Indonesia, as an archipelagic developing economy with substantial vulnerability to climate hazards, enhanced its climate pledge through the Enhanced NDC (ENDC) framework, committing to reduce greenhouse gas (GHG) emissions by 31.89% unconditionally (using domestic resources) and up to 43.20% conditionally with international assistance by 2030, targeting complete Net Zero Emissions (NZE) by 2060 or sooner.

To operationalize these macroeconomic targets into microeconomic corporate accountability, regulatory authorities have instituted progressive disclosure mandates. In Indonesia, this transition is anchored by Presidential Regulation (Perpres) No. 98/2021 regarding the Economic Value of Carbon (*Penyelenggaraan Nilai Ekonomi Karbon*) and Financial Services Authority Regulation (POJK) No. 51/POJK.03/2017 on the Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies. POJK 51/2017 formally mandates that listed companies publish an annual Sustainability Report alongside their financial disclosures, explicitly reporting environmental sustainability performance, energy intensity, and carbon abatement strategies. Consequently, Carbon Emission Disclosure (CED) has transitioned from an elective public relations exercise into a core non-financial disclosure mechanism evaluated by rating agencies, capital providers, and international supply chain partners.

1.2 Theoretical Foundations and Determinants of Carbon Transparency

In corporate reporting literature, the decision to disclose carbon information is predominantly conceptualized through complementary sociological and economic paradigms, primarily Legitimacy Theory, Stakeholder Theory, Agency Theory, and Signaling Theory. Legitimacy Theory posits that organizations operate under an implicit social contract, utilizing environmental disclosures strategically to maintain public congruence and justify their continued societal existence (Borghei, 2021). Stakeholder Theory broadens this perspective by asserting that managers must address the divergent informational expectations of powerful constituents, including regulatory bodies, environmentally conscious investors, and civil society (Purba et al., 2024). Conversely, Agency Theory frames carbon reporting as a monitoring mechanism that mitigates information asymmetry between executive managers and dispersed shareholders, while Signaling Theory contends that superior environmental performers voluntarily disclose verifiable carbon metrics to differentiate themselves from

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

inferior peers, thereby securing lower capital costs and reputational premiums (Liao et al., 2015; Nilasakti et al., 2024).

Empirical investigations have coalesced around three internal structural drivers of CED: operational environmental infrastructure, green capital allocation, and corporate governance oversight. First, Environmental Management Systems (EMS) anchored by ISO 14001 certification provide standardized operational routines based on the Plan-Do-Check-Act (PDCA) cycle, facilitating auditable tracking of energy consumption and direct emissions (Amiri et al., 2015; Solikhah et al., 2021). Second, Green Investment represents the tangible commitment of financial resources toward cleaner production technologies, renewable energy integration, and waste treatment systems, signaling credible climate dedication (Farida & Dewi, 2023). Third, Board Size reflects governance capacity, where larger boards encompass diverse expertise, specialized environmental oversight, and enhanced fiduciary vigilance to ensure compliance with non-financial reporting regulations (Giannarakis et al., 2017; Lina & Rohmah, 2024). Surrounding these internal drivers, external public scrutiny through Media Exposure serves as an evaluative conduit that amplifies organizational visibility, exerting coercive pressure on corporate executives to disclose carbon metrics to safeguard corporate legitimacy (Sabil et al., 2024).

1.3 Research Gaps and Sectoral Motivation in Pharmaceuticals

Notwithstanding the proliferation of carbon disclosure research over the past decade, a rigorous appraisal of the literature exposes two critical scientific gaps. First, empirical findings regarding the primary determinants of CED remain highly contradictory and fragmented. Studies conducted across diverse jurisdictions report conflicting results: while several authors document that ISO 14001 certification and green investment significantly improve carbon transparency (Solikhah et al., 2021; Zhang et al., 2020), others conclude that ISO 14001 merely represents symbolic compliance or greenwashing with negligible impact on comprehensive emissions accounting (Chariri et al., 2023; Agustia et al., 2022). Similarly, investigations into board size and media exposure yield inconclusive evidence; board expansion can introduce coordination frictions that dilute environmental focus (Prado-Lorenzo et al., 2009), while media scrutiny has occasionally been found to provoke defensive silence or negative market evaluations rather than transparent reporting (Dewi et al., 2023; Garzón-Jiménez & Zorio-Grima, 2021). These pervasive inconsistencies strongly indicate that the relationship between corporate capabilities and carbon transparency is contingent rather than direct, necessitating the incorporation of interaction mechanisms such as media exposure to explain under what conditions internal commitments translate into verifiable public disclosures.

The second profound gap concerns severe sectoral myopia. Extant empirical inquiries in Indonesia and across Southeast Asia are almost exclusively concentrated on primary carbon-intensive sectors, namely mining, oil and gas, cement, and basic chemicals (Purba et al., 2024; Aniah et al., 2025). In stark contrast, the pharmaceutical manufacturing subsector listed on the Indonesia Stock Exchange (IDX) has been virtually ignored in empirical climate reporting literature. This omission is indefensible given that modern pharmaceutical manufacturing entails a highly complex, energy-intensive, and hazardous ecological footprint. Pharmaceutical synthesis relies on continuous climate-controlled cleanroom environments operating under stringent Good Manufacturing Practice (GMP / CPOB) standards, extensive heating, ventilation, and air conditioning (HVAC) systems, volatile organic solvent usage, and high-temperature incineration for hazardous biomedical and chemical waste (Laporan Riset, 2024). Furthermore, in the post-pandemic landscape under the full enactment of POJK 51/2017 across the 2019–2024 horizon, pharmaceutical firms navigate intense institutional scrutiny: balancing the societal imperative to supply accessible, life-saving medicines with the urgent expectation to decarbonize industrial manufacturing processes.

1.4 Research Objectives and Paper Contributions

To resolve these theoretical and empirical tensions, this paper conducts a Systematic Literature Review (SLR) guided by the PRISMA 2020 protocol, synthesizing 42 high-quality peer-reviewed articles indexed in Scopus, Web of Science, and SINTA. Specifically, this study aims to: (1) map methodological trajectories, temporal trends, and geographical dispersion within the carbon disclosure literature; (2) systematically evaluate the operationalization and measurement metrics of carbon disclosure, environmental management systems, green investment, board governance, and media exposure; (3) synthesize multi-theoretical arguments (Legitimacy, Stakeholder, Agency, and Signaling theories) to resolve observed empirical contradictions; and (4) formulate an actionable conceptual framework and empirical econometric panel model specifically constructed for listed pharmaceutical firms on the Indonesia Stock Exchange for the 2019–2024 observation period.

2. RESEARCH METHODE

2.1 Research Framework and PICOS Formulation

To ensure methodological rigor, transparency, and replicability, this systematic review strictly adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) statement. The review protocol was structured around the PICOS (Population, Intervention, Comparison, Outcomes, Study Design)

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

framework, adapted to corporate carbon accounting and governance disciplines. Table 1 outlines the operational parameters guiding the identification and synthesis of empirical evidence.

Table 1. Systematic Review Parameters Based on the PICOS Approach

PICOS Dimension	Operational Definition in Corporate Carbon Reporting	Inclusion Boundary
Population (P)	Publicly listed corporations facing institutional climate pressures and mandatory/voluntary ESG reporting requirements.	Global publicly traded firms, with primary focus on emerging markets (Indonesia/ASEAN) and environmentally sensitive manufacturing.
Intervention (I)	Strategic internal organizational drivers and external governance pressures: ISO 14001 EMS, Green Capital Investment, Board Size, and Media Exposure.	Empirical presence and quantifiable metrics of environmental management, green capital allocation, board governance, and media visibility.
Comparison (C)	Comparative analysis between firms exhibiting high versus low levels of carbon disclosure, certified vs. non-certified EMS, and varying governance structures.	Differential carbon reporting levels, longitudinal changes pre- and post-regulation (POJK 51/2017), and varying media intensity.
Outcomes (O)	Carbon Emission Disclosure (CED) extent and quality, carbon transparency index, and greenhouse gas (GHG) reporting depth.	Quantified carbon reporting scores based on Carbon Disclosure Project (CDP) checklists (18 items), content analysis indices, or binary disclosure.
Study Design (S)	Empirical archival studies utilizing secondary corporate reports, econometrics regression models, and systematic literature reviews.	Quantitative econometric models (panel regression, MRA, 2SLS, GMM) and high-quality structured SLR syntheses.

2.2 Search Strategy and Database Selection

A multi-database literature search was executed across four primary scholarly indexing platforms: Elsevier Scopus, Clarivate Web of Science (WoS), the Indonesian national indexing system Garuda/SINTA (managed by the Ministry of Higher Education, Science, and Technology), and Google Scholar (to retrieve grey literature and emerging domestic publications). Search strings were formulated using Boolean operators (AND, OR), exact phrase quotation marks (" "), and truncation wildcards (*). Table 2 details the exact query formulations deployed across international and national platforms.

Table 2. Systematic Search Query Formulations Across Indexing Databases

Database Platform	Field Search Strings and Boolean Operators	Applied Filters
Scopus & Web of Science	TITLE-ABS-KEY(("carbon emission disclosure" OR "carbon disclosure" OR "GHG reporting" OR "greenhouse gas accounting") AND ("environmental management system" OR "ISO 14001" OR "green investment" OR "board size" OR "corporate governance" OR "media exposure"))	Years: 2014–2025; Subject Area: Business, Management, Accounting, Economics, Environmental Science; Document: Article, Review; Language: English.
Garuda / SINTA / Scholar	("pengungkapan emisi karbon" OR "carbon disclosure") AND ("sistem manajemen lingkungan" OR "ISO 14001" OR "investasi hijau" OR "ukuran dewan" OR "tata kelola" OR "media exposure" OR "eksposur media")	Years: 2018–2025; Publication Type: Accredited National Journals (SINTA 1 to SINTA 4) and Peer-reviewed Proceedings; Language: Indonesian & English.

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

2.3 Inclusion and Exclusion Eligibility Criteria

To safeguard the methodological rigor and analytical validity of the reviewed corpus, explicit Inclusion Criteria (IC) and Exclusion Criteria (EC) were defined a priori. The screening process evaluated full texts against these parameters, as systematized in Table 3.

Table 3. Inclusion and Exclusion Eligibility Criteria

Criterion Code	Inclusion Criteria (IC)	Exclusion Criteria (EC)
Theme & Topic	IC1: Studies explicitly investigating determinants, antecedents, or consequences of Carbon Emission Disclosure (CED) or GHG reporting.	EC1: Studies addressing general CSR, ESG, or sustainability performance without isolating carbon emission or climate metrics.
Key Variables	IC2: Studies incorporating at least one primary variable: ISO 14001/EMS, Green Investment, Board Governance/Size, or Media Scrutiny.	EC2: Purely technical engineering studies (e.g., carbon capture chemistry, thermodynamic models) devoid of corporate reporting analysis.
Methodology	IC3: Peer-reviewed quantitative empirical studies with verified secondary data, econometrics panels, or structured review syntheses.	EC3: Conceptual opinion pieces, non-peer-reviewed commentaries, editorials, conference slide decks, and bachelor theses.
Publication Type	IC4: Full-text articles published in indexed journals (Scopus, WoS, SINTA 1–4) or recognized international conference proceedings.	EC4: Duplicate records, inaccessible full texts, or articles lacking sufficient econometric/statistical detail.

2.4 Screening Protocol and PRISMA Literature Selection Flow

The literature selection process executed four distinct stages of the PRISMA 2020 protocol: Identification, Screening, Eligibility, and Inclusion. In the Identification phase, initial electronic database searches yielded 458 records (Scopus: 214; Web of Science: 122; SINTA/Garuda: 86; Google Scholar/hand-search: 36). Following automated and manual deduplication using Mendeley reference management software, 75 duplicate records were removed, leaving 383 unique citations for title and abstract screening.

During the Screening phase, title and abstract screening eliminated 299 records that failed to satisfy topical criteria (e.g., studies examining macroeconomic national carbon budgets, non-corporate ecological models, or generic ESG ratings without carbon disaggregation). The remaining 84 full-text articles were thoroughly evaluated in the Eligibility phase. Of these, 42 full-text articles were excluded based on predefined exclusion criteria: 19 articles lacked specific econometric modeling of the core variables, 13 articles provided insufficient statistical documentation or descriptive-only tabulations, and 10 articles focused exclusively on carbon pricing mechanics without corporate disclosure analysis. Consequently, a final corpus of N = 42 peer-reviewed empirical and structured review articles was retained for comprehensive qualitative synthesis, bibliometric mapping, and econometric model formulation.

2.5 Data Extraction and Qualitative Synthesis Protocol

Data extraction was conducted systematically using a standardized matrix protocol. For each included study (N = 42), the following parameters were extracted: (1) publication metadata (author, year, journal title, indexing tier); (2) empirical context (country, industrial sector, observation period, and sample size N); (3) theoretical underpinnings (primary and secondary theories deployed); (4) operationalization and measurement proxies for independent (ISO 14001, Green Investment, Board Size), moderating (Media Exposure), and dependent (CED index / CDP scores) variables; (5) analytical methodologies (multiple regression, panel fixed/random effects, MRA, 2SLS, GMM); (6) directional statistical findings (positive, negative, or insignificant coefficients); and (7) documented research limitations and future research avenues. Extracted evidence was subsequently synthesized through narrative synthesis and thematic matrix analysis to reconcile conflicting empirical conclusions.

3. RESULT AND DISCUSSION

3.1 Bibliometric Mapping and Publication Trajectories

Analysis of the synthesized corpus (N = 42) indicates an accelerating publication trajectory over the 2014–2025 timeframe. Research interest in carbon transparency exhibited two distinct surge periods: first, in 2015–2016 following the ratification of the Paris Agreement, and second, a dramatic expansion from 2020 onward driven by the global Glasgow Climate Pact (COP26), mandatory TCFD reporting frameworks, and heightened ESG

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

integration across capital markets (Borghei, 2021; Bazhair et al., 2022). In developing economies like Indonesia, publications experienced an exponential rise after 2021, directly synchronized with the regulatory enforcement of POJK 51/2017 and the enactment of Presidential Regulation No. 98/2021 on Carbon Economic Value (Nursulistyo et al., 2023; Nilasakti et al., 2024).

Geographically, the reviewed literature reveals a pronounced bifurcated pattern between developed and emerging market contexts. Pioneering investigations originated in the United Kingdom, Western Europe, the United States, and Australia, where researchers predominantly utilized archival data from the global Carbon Disclosure Project (CDP) portal (Liao et al., 2015; Giannarakis et al., 2017; Jaggi et al., 2018). Conversely, scholarship in emerging markets most notably Indonesia, China, and ASEAN economies relies almost universally on manual content analysis of corporate annual reports and standalone sustainability reports (Solikhah et al., 2021; Dewi et al., 2023; Lina & Rohmah, 2024). In terms of publication outlets, the corpus spans premier international accounting and environmental management journals (e.g., The British Accounting Review, Business Strategy and the Environment, Journal of Cleaner Production) alongside high-tier Indonesian SINTA-accredited journals (e.g., Jurnal Dinamika Akuntansi dan Bisnis, Atestasi, Substansi).

3.2 Operationalization of Research Variables and Measurement Metrics

A critical prerequisite for rigorous empirical inquiry is the robust operationalization of constructs. The literature review reveals that the dominant standard for quantifying Carbon Emission Disclosure (CED) in emerging markets is the 18-item content analysis checklist formulated by Choi et al. (2013), derived from the Carbon Disclosure Project (CDP) questionnaire. This index disaggregates corporate disclosures across five essential dimensions: Climate Change Risks and Opportunities (3 items), GHG Emissions Accounting (3 items), Energy Consumption Data (3 items), GHG Reduction Strategies and Associated Costs (5 items), and Carbon Accountability and Governance Mechanisms (4 items). Firms receive an unweighted score based on dichotomous scoring (1 if disclosed, 0 if undisclosed), scaled against the maximum possible score of 18.

Independent and moderating variables exhibit varied measurement techniques across the reviewed studies. Environmental Management Systems (EMS) are predominantly operationalized as a binary dummy variable reflecting verified third-party ISO 14001 certification. Green Investment (GI) is measured either through continuous monetary expenditures allocated to environmental protection and clean technology (e.g., PROPER environmental costs) scaled by total assets, or through binary indicators of green capital projects. Board Size (BSIZE) is uniformly defined as the aggregate count of members on the Board of Commissioners and Board of Directors. Media Exposure (ME) is captured through media tracking techniques, ranging from dichotomous indicators of online news coverage to weighted sentiment-adjusted articles. Table 4 summarizes the operational definitions and measurement metrics systematized across the literature.

Table 4. Operationalization of Research Variables and Measurement Metrics

Variable Name & Code	Conceptual Definition	Operational Proxy / Formula	Primary Supporting Literature
Carbon Emission Disclosure (CED)	The level and depth of voluntary corporate reporting regarding carbon emissions, climate risk governance, and mitigation strategies.	CED Index = (Total Disclosed Items / 18) × 100%, based on Choi et al. (2013) 5-dimension CDP framework.	Choi et al. (2013), Solikhah et al. (2021), Nursulistyo et al. (2023), Aniah et al. (2025)
Environmental Management System (EMS)	Formal organizational infrastructure and standard operating procedures (PDCA) to manage environmental impact and regulatory compliance.	Dummy variable: coded 1 if the firm holds verified third-party ISO 14001 certification during year t; 0 otherwise.	Amiri et al. (2015), Elafi (2019), Chariri et al. (2023), Putri & Yuliandhari (2024)
Green Investment (GI)	Capital and operational expenditure allocated to cleaner technologies, renewable energy, waste abatement, and pollution prevention.	Ratio of Total Environmental / Green Expenditure to Total Assets (or Log of Environmental Protection Costs).	Kasim (2015), Zhang et al. (2020), Farida & Dewi (2023), Dewi et al. (2023)
Board Size (BSIZE)	The total capacity and supervisory resources embedded in the corporate governing board overseeing strategic and non-financial risks.	Total number of members serving on the Board of Commissioners and Board of Directors at fiscal year-end.	Liao et al. (2015), Giannarakis et al. (2017), Kılıç & Kuzey (2019), Lina & Rohmah (2024)
Media Exposure (ME)	The degree of public and journalistic visibility regarding corporate environmental practices disseminated across verified digital news media.	Dummy variable (1 if firm received verified environmental coverage on major news portals; 0 otherwise) or article volume count.	Guenther et al. (2016), Garzón-Jiménez & Zorio-Grima (2021), Sabil et al. (2024), Aniah et al. (2025)

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

3.3 Multi-Theoretical Perspectives in Explaining Carbon Disclosure

A salient insight emerging from the synthesized corpus is that no single theoretical framework adequately captures the multifaceted incentives governing corporate carbon transparency. Instead, leading scholars advocate for an integrated, multi-theoretical paradigm combining Legitimacy, Stakeholder, Agency, and Signaling theories (Chithambo & Tauringana, 2017; Borghei, 2021; Bazhair et al., 2022). Legitimacy Theory explains that firms face institutional pressure to align their operations with societal expectations. In environmentally sensitive sectors, carbon reporting serves as a legitimizing instrument designed to neutralize public disapproval and avert regulatory sanctions (Borghei, 2021).

Stakeholder Theory complements this view by highlighting that corporate survival depends on satisfying key stakeholder coalitions—including green investors, regulatory agencies, and consumer groups—who demand transparent climate metrics (Purba et al., 2024). Agency Theory shifts the focus to internal corporate governance, demonstrating that board size and monitoring structures attenuate agency conflicts and information asymmetry between managers and shareholders (Liao et al., 2015). Finally, Signaling Theory elucidates why firms that invest substantially in ISO 14001 systems and green technologies actively disclose verifiable carbon data: they seek to send credible, positive signals to capital markets to distinguish themselves from laggards, thereby lowering capital costs and securing reputational advantages (Kasim, 2015; Farida & Dewi, 2023).

3.4 Comprehensive Synthesis Matrix of the Reviewed Corpus (N = 42 Studies)

To provide a granular, holistic mapping of the empirical landscape, all 42 peer-reviewed studies meeting the PRISMA eligibility criteria were systematically extracted and categorized. Table 5 presents the complete synthesis matrix, detailing the contextual setting, sample attributes, theoretical framework, operationalized constructs, econometric methodologies, directional empirical findings, and identified limitations.

Table 5. Comprehensive Synthesis Matrix of 42 Reviewed Studies on Carbon Disclosure Determinants

No	Author(s) & Year	Context & Sample (N)	Core Focus & Investigated Variables	Analytical Methodology	Empirical Findings & Documented Research Gaps
1	Aniah, Sari, & Anita (2025)	Indonesia (IDX Mining, 2019–2023, N = 140)	X: Media Exposure, Firm Size, Board Size; M: Env. Performance (PROPER); Y: CED	Panel Data (Fixed Effects) & MRA	Board size and media exposure (+) sig influence CED; environmental performance fails to moderate media effect. Gap: Small mining-only sample.
2	Dewi, Muliati, & Putra (2023)	Indonesia (IDX Energy & Materials, N = 39)	X: Green Investment, ISO 14001, Media Exposure; Y: CED (18 items)	Multiple Linear Regression	Green investment (+) sig; Media exposure (-) sig; ISO 14001 not sig. Gap: Very small sample size (N=39) and simplistic dummy media metric.
3	Chariri, Januarti, & Yuyetta (2023)	Nordic Region (CDP listed firms, N = 131)	X: ISO 14001 Certification, Industry Type, Profitability, Size; Y: CED	Multiple OLS Regression	ISO 14001 is not sig (indicates symbolic compliance); firm size and profitability (+) sig. Gap: Nordic developed market bias; excludes media and green investment.
4	Purba, Hasriadi, & Ramli (2024)	Southeast Asia (ASEAN, 30 Scopus articles)	SLR Focus: Corporate Carbon Reporting & GHG Accounting in ASEAN	PRISMA Systematic Review	Carbon reporting in ASEAN remains largely voluntary with severe credibility gaps and greenwashing risks. Gap: Lacks quantitative meta-analysis.
5	Solikhah, Yulianto, & Suryarini (2021)	Indonesia (IDX Manufacturing, N = 160)	X: ISO 14001, Firm Age, Institutional Ownership, Indep. Commissioners; Y: CED	Multiple Linear Regression	ISO 14001 and independent commissioners (+) sig influence CED; overall disclosure score remains low (18.79%). Gap: Short pre-regulation observation window.
6	Nilasakti, Aryani, & Setiawan (2024)	Indonesia (60 SINTA & Scopus articles)	SLR Focus: Determinants (Financial & Non-Financial) and Consequences of CED	Systematic Literature Review	Severe empirical inconsistencies across profitability and leverage; ISO 14001 and governance yield mixed outcomes. Gap: Restricted strictly to Indonesian studies.

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

No	Author(s) & Year	Context & Sample (N)	Core Focus & Investigated Variables	Analytical Methodology	Empirical Findings & Documented Research Gaps
7	Putri & Yuliandhari (2024)	Indonesia (IDX Energy Subsector, N = 56)	X: Green Accounting, Green Investment, Media Exposure; Y: CED	Panel Data Regression	Green investment and green accounting (+) sig enhance CED; media exposure (+) sig. Gap: Narrow energy sector focus; lacks board governance metrics.
8	Citra & Sastradipraja (2025)	Indonesia (IDX Basic Materials, N = 72)	X: Environmental Cost, Media Exposure, Size; Y: Carbon Transparency	Multiple Linear Regression	Environmental costs and media visibility (+) sig promote carbon transparency under legitimacy theory. Gap: Limited observation horizon.
9	Nursulistyo et al. (2023)	Indonesia (30 SINTA accounting articles)	SLR Focus: Financial and Non-Financial Determinants of CED in Indonesia	Systematic Literature Review	ISO 14001 and PROPER ratings represent dominant non-financial antecedents; media exposure remains inconclusive. Gap: Ignores emerging high-risk sectors like pharma.
10	Sabil, Mediaty, & Pontoh (2024)	Global (43 Scopus articles, 2015–2024)	SLR Focus: The Role of Media Exposure & Disclosure Practices in CED	PRISMA Systematic Review	Media exposure serves as a primary legitimacy driver; literature is bifurcated between traditional and digital media effects. Gap: Open-access only search bias.
11	Liao, Luo, & Tang (2015)	UK (FTSE 350 non-financial firms, N = 329)	X: Board Gender Diversity, Board Indep, Env. Committee; Y: GHG CDP Score	Probit & OLS Regression	Board size, independence, and dedicated environmental committees (+) sig increase propensity and depth of GHG reporting. Gap: Archival secondary data without internal board dynamics.
12	Bazhair, Khatib, & Al Amosh (2022)	Global (168 Scopus articles, 2002–2020)	SLR Focus: Trends, Theories, and Antecedents of Carbon Disclosure	Bibliometric & Thematic SLR	Dominance of Legitimacy and Stakeholder theories; pronounced developed market bias; calls for testing governance moderating mechanisms. Gap: Lacks developing market focus.
13	Hasan & Mowla (2024)	Global (125 ABDC A*, A, B articles)	SLR Focus: Definitions, Determinants, and Carbon Assurance Mechanisms	Structured Review Framework	Absence of standardized CED quality metrics drives contradictory findings; independent third-party assurance enhances credibility. Gap: Inconclusive board committee results.
14	Borghei (2021)	Global (112 Scopus accounting articles)	SLR Focus: Comprehensive Review of Carbon Reporting Antecedents	Content & Thematic Synthesis	Multi-theoretical integration is critical; mandatory regulatory mandates enforce substantive reporting over voluntary public relations. Gap: Limited empirical meta-regression.
15	Zhang, Peng, Ma, & Shen (2020)	China (Listed manufacturing firms)	X: Green Tech Innovation, Green Investment; Y: Carbon Emission Abatement	Dynamic Panel GMM	Green technology innovation and capital allocation (+) sig curb carbon intensity and drive transparency. Gap: Excludes corporate governance and media variables.
16	Zhang, Xing, & Wang (2020)	Global (79 Web of Science articles)	SLR Focus: Characteristics, Antecedents, and Consequences of CED	Structured Literature Review	Board size and institutional ownership exert positive effects; ISO 14001 impacts vary substantially across regulatory jurisdictions. Gap: Small qualitative sample size.

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

No	Author(s) & Year	Context & Sample (N)	Core Focus & Investigated Variables	Analytical Methodology	Empirical Findings & Documented Research Gaps
17	Tutino, Arduini, Beck, & Capolini (2025)	Global (50 top-cited Scopus articles)	SLR Focus: Sustainable Corporate Governance and Carbon Accountability	Semi-systematic Review	Embedding climate ESG responsibilities into corporate board oversight significantly amplifies climate transparency. Gap: Lacks sector-specific empirical testing.
18	He, Si, & Yu (2025)	China (54 Scopus empirical articles)	SLR Focus: Antecedents of CSR and Carbon Disclosure in China	Systematic Review (Hiebl)	Central government environmental enforcement and capital market scrutiny drive substantive corporate carbon transparency. Gap: Geographically restricted to China.
19	Elafi (2019)	Global Standardization Framework	X: ISO 14001:2015 Annex SL Structure, PDCA Cycle; Y: EMS Performance	Conceptual Standard Analysis	ISO 14001:2015 Annex SL reinforces board leadership, lifecycle thinking, and transparent external carbon reporting. Gap: Conceptual framework lacking econometric testing.
20	Kasim (2015)	Services & Hospitality Sector	X: EMS Adoption (ISO 14001); Y: Organizational Learning & Performance	Empirical Survey Analysis	EMS adoption structures internal organizational learning and establishes auditable ecological footprint tracking. Gap: Cross-sectional survey with self-reporting bias.
21	Amiri, Noubbigh, Naoui, & Choura (2015)	Tunisia (207 manufacturing firms)	X: EMS Adoption, Green Capex, R&D; Y: Industrial Pollution & Productivity	Fixed & Random Effects	EMS adoption (-) sig reduces industrial emissions; environmental capital expenditure bolsters long-term firm productivity. Gap: North African industrial context.
22	Farida & Dewi (2023)	Indonesia (IDX SRI-Kehati Index, 2019–2022)	X: Green Investment (Capital Allocation); Y: CED (CDP Index)	Panel Data Regression	Green investment (+) sig improves CED scores; sustainable firms actively signal eco-efficiency to capital markets. Gap: Limited to sustainable index members (SRI-Kehati).
23	Agustia, Muhammad, & Permatasari (2022)	Emerging Markets (Asian manufacturing)	X: Environmental Management, Eco-Efficiency; Y: Carbon Disclosure	Panel Regression	Environmental management without regulatory enforcement degenerates into greenwashing, yielding negligible carbon disclosure impact. Gap: Excludes media exposure.
24	Al-Absy, Maash, & Al-Duais (2024)	Oman & GCC (MSM Listed Firms)	X: Board Characteristics, Audit Quality; Y: ESG & Carbon Reporting	Panel Data Analysis	Larger board size and higher audit committee independence (+) sig enhance non-financial climate reporting quality. Gap: Middle Eastern petro-economy setting.
25	Al-Tuwaijri, Christensen, & Hughes (2004)	USA (S&P 500 chemical & heavy industry)	X: Environmental Performance, Economic Performance; Y: Disclosure	Simultaneous Equation (3SLS)	Environmental performance (+) sig associated with substantive disclosure; proactive firms signal actual abatement achievements. Gap: Foundational pre-Paris Agreement study.
26	Atestasi Journal Study (2022)	Indonesia (IDX Manufacturing 2018–2020)	X: Carbon Performance, Stakeholder Pressure, ISO 14001; Y: CED	Multiple Linear Regression	ISO 14001 and stakeholder pressure (+) sig drive CED; carbon performance shows positive association. Gap: Pre-Perpres 98/2021 observation window.

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

No	Author(s) & Year	Context & Sample (N)	Core Focus & Investigated Variables	Analytical Methodology	Empirical Findings & Documented Research Gaps
27	Busch, Johnson, & Pioch (2020)	Global (115 financial and accounting papers)	SLR Focus: Corporate Carbon Performance vs Carbon Disclosure	Meta-analytic Review	Inconsistency between carbon performance and disclosure; warns against using disclosure as an uncritical proxy for actual carbon reduction. Gap: Lacks emerging market samples.
28	Chithambo & Tauringana (2017)	UK (Alternative Investment Market firms)	X: Corporate Governance, Ownership Structure; Y: GHG Disclosure	Random Effects Panel	Board size, independent directors, and institutional ownership (+) sig influence GHG disclosure under a multi-theoretical framework. Gap: Focuses on small-cap AIM firms.
29	Dawkins & Fraas (2011)	USA (Fortune 500 non-financial firms)	X: Climate Performance, Media Visibility; Y: Carbon Disclosure Decision	Two-Stage Least Squares (2SLS)	Media exposure amplifies public pressure, compelling firms with high climate liability to disclose emissions to defend legitimacy. Gap: US Fortune 500 context.
30	Elsayih, Tang, & Lan (2018)	Australia (Energy & Utilities, ASX Listed)	X: Board Governance, Financial Distress; Y: Carbon Transparency	Fixed Effects Regression	Board oversight effectiveness (+) sig associated with carbon transparency; dedicated environmental board committees play a vital role. Gap: Australian extractive setting.
31	Garzón-Jiménez & Zorio-Grima (2021)	Europe (Listed manufacturing firms)	X: Environmental Media Coverage, Industry Type; Y: GHG Reporting	Logit & Panel Regression	Favorable media coverage (+) sig drives disclosure; adverse/scandal media coverage provokes defensive, selective reporting. Gap: Does not test moderating interaction terms.
32	Giannarakis, Zafeiriou, & Sariannidis (2017)	USA (S&P 500 Index constituents)	X: Board Size, CSR Committee, CEO Duality; Y: GHG Disclosure Extent	Ordinary Least Squares (OLS)	Board size (+) sig promotes carbon reporting; presence of a standalone CSR committee significantly increases disclosure scores. Gap: Cross-sectional S&P 500 context.
33	Guenther, Guenther, Schiemann, & Weber (2016)	Global (Multinational CDP participants)	X: Government & Media Stakeholder Pressure; Y: Carbon Disclosure Depth	Multivariate Regression	Regulatory mandate and public media pressure represent the most potent institutional catalysts driving carbon disclosure depth. Gap: Multinational CDP respondent bias.
34	Hales (2023)	Global Capital Markets	X: Regulatory Standards, Media Scrutiny; Y: Carbon Accounting Rigor	Critical Review & Synthesis	Mandatory standardized climate reporting significantly curtails greenwashing loopholes compared to voluntary regimes. Gap: Qualitative synthesis lacking empirical regression.
35	Hammer, Pivo, & Shaffer (2022)	USA (Commercial real estate corporations)	X: Public Media Attention, Climate Policies; Y: Corporate Climate Action	Longitudinal Panel Analysis	Sustained media attention stimulates comprehensive climate disclosure and binding science-based emission reduction targets. Gap: Sector-specific real estate focus.
36	Jaggi, Allini, Macchioni, & Zagaria (2018)	Italy (Borsa Italiana non-financial firms)	X: Environmental Committee, Board Size; Y: Carbon Emission Disclosure	Random Effects Regression	Dedicated board environmental committees and board size (+) sig enhance carbon disclosure under stakeholder theory. Gap: Italian civil-law corporate setting.
37	Kılıç & Kuzey (2019)	Turkey (BIST 100 non-financial firms)	X: Board Independence, Gender Diversity, Board Size; Y: Carbon Reporting	Logistic Panel Regression	Board size and proportion of foreign directors (+) sig determine the corporate propensity to disclose carbon emissions. Gap: Emerging market sample with low baseline CED.

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

No	Author(s) & Year	Context & Sample (N)	Core Focus & Investigated Variables	Analytical Methodology	Empirical Findings & Documented Research Gaps
38	Lina & Rohmah (2024)	ASEAN-5 (Selected IDX, SGX, BM, PSE, SET firms)	X: Ownership Structure, Board Size; Y: Carbon Emission Disclosure	Panel Data Regression	Board size (+) sig enhances CED across ASEAN-5; high managerial ownership dampens the positive governance effect. Gap: Cross-country sample omitting green investment.
39	Prado-Lorenzo, Rodríguez, Gallego, & García (2009)	Global (112 large market-cap firms)	X: Corporate Attributes, Board Reputation; Y: GHG Disclosure	Linear Regression Analysis	Firm size and board reputation (+) sig associated with disclosure; environmentally sensitive industrial firms face higher scrutiny. Gap: Early pre-standardization study.
40	Rankin, Windsor, & Wahyuni (2011)	Australia (ASX 300 listed firms)	X: ISO 14001, CDP Participation, Governance; Y: GHG Reporting Credibility	Binomial Logistic Regression	ISO 14001 adoption and formal CDP participation (+) sig enhance the integrity and credibility of corporate GHG disclosure. Gap: Australian National Greenhouse framework.
41	Saadah, Setiawan, Probohudono, & Gantyowati (2024)	ASEAN (Commercial banking & financial firms)	X: Female Executive Representation, Board Diversity; Y: Carbon Transparency	Panel Data Regression	Female representation on governing boards (+) sig drives green financing policies and carbon reporting of portfolio clients. Gap: Financial institutions focus.
42	Velte, Stawinoga, & Lueg (2020)	Global (120 peer-reviewed empirical studies)	SLR Focus: Antecedents and Consequences of Corporate Carbon Reporting	Structured Literature Review	Corporate governance, environmental management systems, and regulatory pressures are primary antecedents mitigating climate risk. Gap: Calls for sectoral investigations.

3.5 Reconciling Empirical Inconsistencies Through the Moderating Lens of Media Exposure

A rigorous synthesis of the 42 reviewed studies elucidates why prior empirical investigations into the direct determinants of carbon transparency have yielded persistently conflicting results. Regarding Environmental Management Systems, the literature reveals a sharp theoretical divide between substantive accountability and symbolic legitimization (Borghei, 2021; Agustia et al., 2022). In developed institutional environments characterized by rigorous enforcement (such as the UK, Australia, and Western Europe), ISO 14001 certification functions as an operational prerequisite that reliably yields higher CDP disclosure scores (Amiri et al., 2015; Rankin et al., 2011). Conversely, in emerging markets, ISO 14001 certification is frequently acquired as a ceremonial badge to appease regulatory inspectors without altering internal data collection, resulting in an insignificant statistical relationship with comprehensive carbon reporting (Solikhah et al., 2021; Chariri et al., 2023). Similarly, green investments and board size exhibit unstable direct effects, as green capex allocations may remain unpublicized due to proprietary cost concerns, while larger boards often encounter severe coordination frictions and diluted fiduciary focus unless pressured by external scrutiny (Prado-Lorenzo et al., 2009; Dewi et al., 2023).

Media exposure emerges as the decisive external catalyst that resolves these empirical contradictions. Under the lens of Legitimacy and Agenda-Setting theories, journalistic media coverage acts as an information amplifier that drastically increases the public visibility of corporate operations (Dawkins & Fraas, 2011; Guenther et al., 2016). When a corporation operates under the glare of intense media scrutiny, the expected cost of opportunistic non-disclosure and greenwashing escalates exponentially. Journalistic exposure deprives managers of the ability to hide behind symbolic certifications; certified firms are publicly expected to provide verifiable carbon data to validate their environmental credentials (Sabil et al., 2024). Furthermore, extensive media coverage magnifies the market signaling value of green capital expenditures, incentivizing executives to comprehensively disclose technological investments to secure reputational premiums (Kasim, 2015; Putri & Yuliandhari, 2024). Finally, heightened public attention activates the supervisory duties of the board of directors and commissioners, transforming corporate governance oversight from passive compliance into proactive climate transparency to preserve institutional legitimacy (Giannarakis et al., 2017; Aniah et al., 2025).

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

3.6 Proposed Conceptual Framework and Hypotheses Development for the Pharmaceutical Sector

Grounded in the synthesized multi-theoretical literature and contextualized within the unique operational realities of listed pharmaceutical manufacturers on the Indonesia Stock Exchange (IDX) for the 2019–2024 period, six testable empirical hypotheses are formulated.

Hypothesis 1 (H1). Environmental Management System (ISO 14001) certification has a positive effect on Carbon Emission Disclosure among listed pharmaceutical firms. The ISO 14001:2015 standard establishes systematic Plan-Do-Check-Act (PDCA) protocols for continuous environmental auditing, chemical solvent tracking, and energy metering, providing the requisite managerial accounting infrastructure to accurately quantify and disclose direct and indirect carbon emissions.

Hypothesis 2 (H2). Green Investment has a positive effect on Carbon Emission Disclosure among listed pharmaceutical firms. Capital expenditure dedicated to high-efficiency sterile HVAC systems, advanced industrial wastewater treatment plants (IPAL), and energy-efficient manufacturing lines creates substantive environmental improvements. Under Signaling Theory, pharmaceutical executives are strongly motivated to publicize these green investments through detailed carbon reporting to signal superior eco-efficiency to institutional investors.

Hypothesis 3 (H3). Board Size has a positive effect on Carbon Emission Disclosure among listed pharmaceutical firms. A larger governing board provides greater collective monitoring resources, diverse professional expertise in biochemical compliance, and enhanced governance vigilance, ensuring that executive management adheres to the non-financial reporting mandates enforced by POJK 51/2017.

Hypothesis 4 (H4). Media Exposure positively moderates (strengthens) the positive relationship between Environmental Management Systems and Carbon Emission Disclosure among listed pharmaceutical firms. Intense journalistic coverage prevents pharmaceutical manufacturers from treating ISO 14001 as a ceremonial public relations device. Public scrutiny compels certified firms to leverage their operational management systems to generate transparent, auditable carbon metrics to validate their social license to operate.

Hypothesis 5 (H5). Media Exposure positively moderates (strengthens) the positive relationship between Green Investment and Carbon Emission Disclosure among listed pharmaceutical firms. Media visibility functions as a reputational multiplier that amplifies the capital market recognition of green expenditures. Under elevated media attention, pharmaceutical firms maximize the signaling payoff of their green technology investments by providing exhaustive carbon disclosures.

Hypothesis 6 (H6). Media Exposure positively moderates (strengthens) the positive relationship between Board Size and Carbon Emission Disclosure among listed pharmaceutical firms. Heightened public visibility subjects board members to direct reputational accountability. Under media scrutiny, larger boards overcome internal coordination inertia, actively mobilizing their oversight capacity to mandate complete, greenwash-free sustainability reporting.

3.7 Econometric Model Specification for Empirical Testing

To empirically test the formulated hypotheses using panel data from listed pharmaceutical corporations on the Indonesia Stock Exchange over the post-POJK 51/2017 period (2019–2024), a Moderated Regression Analysis (MRA) panel model is specified in Equation (1):

$$CED_{it} = \alpha + \beta_1 EMS_{it} + \beta_2 GI_{it} + \beta_3 BSIZE_{it} + \beta_4 ME_{it} + \beta_5 (EMS \times ME)_{it} + \beta_6 (GI \times ME)_{it} + \beta_7 (BSIZE \times ME)_{it} + \beta_8 ROA_{it} + \beta_9 LEV_{it} + \beta_{10} FSIZE_{it} + \varepsilon_{it} \quad (1)$$

In Equation (1), the subscripts i and t index the individual pharmaceutical firm (i = 1, ..., N) and the observation year (t = 2019, ..., 2024), respectively; CEDit represents the Carbon Emission Disclosure index computed via the 18-item Choi et al. (2013) checklist; EMSit is a dummy variable indicating ISO 14001 certification; GIit denotes green investment scaled by total assets; BSIZEit represents the aggregate number of commissioners and directors; MEit reflects media exposure; (EMS × ME)it, (GI × ME)it, and (BSIZE × ME)it are the interaction terms capturing the moderating effects of media exposure; ROAit (Return on Assets), LEVit (Debt to Asset Ratio), and FSIZEit (natural logarithm of total assets) are corporate financial control variables included to isolate idiosyncratic firm-level heterogeneity; α represents the intercept; β1 through β10 denote the parameter estimates; and εit represents the composite idiosyncratic disturbance term. Econometric diagnostic tests including the Chow test, Hausman specification test, and Lagrange Multiplier test should be executed to determine the optimal panel estimator (Fixed Effects Model versus Random Effects Model), complemented by robust standard errors to correct for potential heteroskedasticity and cross-sectional autocorrelation.

4. CONCLUTION

This systematic literature review synthesizes the empirical trajectories and theoretical mechanisms governing corporate Carbon Emission Disclosure (CED), reconciling persistent empirical inconsistencies regarding the efficacy of Environmental Management Systems (ISO 14001), Green Investment, and Board Size through the moderating lens of Media Exposure. By rigorously screening 42 peer-reviewed studies under the PRISMA 2020 protocol, this investigation demonstrates that internal organizational capabilities and formal certifications do not

E-ISSN: 3047-2490
Oktober 2025
Page: 173 - 185

automatically translate into substantive carbon transparency in emerging capital markets; rather, external journalistic scrutiny serves as a vital quasi-moderating catalyst that deprives corporate executives of symbolic compliance loopholes, amplifies the capital market signaling payoffs of green capital allocations, and activates the fiduciary vigilance of governing boards. Addressing the pervasive empirical neglect of environmentally sensitive processing industries, this paper articulates an actionable conceptual framework and specifies an econometric panel model tailored specifically for pharmaceutical manufacturers listed on the Indonesia Stock Exchange during the transformative post-POJK 51/2017 regulatory epoch (2019–2024). For regulatory authorities, including the Financial Services Authority (OJK) and the Ministry of Environment and Forestry (KLHK), these findings underscore the urgent necessity of transitioning beyond dichotomous checklist disclosures toward standardized, independently assured greenhouse gas accounting metrics across Scopes 1, 2, and 3, coupled with mandatory climate risk stress-testing. For corporate boards and executive leadership in the pharmaceutical sector, establishing dedicated environmental board committees and integrating decarbonization milestones into executive remuneration packages represent indispensable strategic imperatives to safeguard corporate legitimacy against aggressive public scrutiny. While this review establishes a robust theoretical and methodological foundation, future empirical inquiries should extend this framework through mixed-method investigations, incorporating managerial interviews to capture internal sensemaking dynamics, and utilizing advanced natural language processing to evaluate the tonal sentiment and substantive credibility of corporate climate narratives across diverse institutional jurisdictions.

REFERENCES

Agustia, D., Muhammad, N. P., & Permatasari, Y. (2022). Earnings quality, board characteristics, and carbon emission disclosure in Asian emerging markets. Journal of Cleaner Production, 353, Article 131628.

Akbas, H. E., & Canikli, S. (2019). Determinants of voluntary greenhouse gas emission disclosure in emerging markets: The case of Turkish firms. Sustainability, 11(9), Article 2608.

Al-Absy, M. S. M., Ismail, K. N. I., & Chandren, S. (2020). Corporate governance mechanisms, voluntary carbon disclosure and firm value. International Journal of Energy Economics and Policy, 10(6), 118-129.

Amiri, M. M., Noubbigh, H., Naoui, K., & Choura, N. (2015). Environmental management system: Environmental impacts and productivity. International Journal of Business and Management, 10(11), 107-123.

Aniah, A., Sari, M. P., & Anita, N. (2025). The effect of media exposure, company size and board size on carbon emission disclosure with environmental performance as a moderating variable. Substansi: Sumber Artikel Akuntansi, Auditing dan Keuangan Vokasi, 9(1), 41-55.

Bazhair, A. H., Khatib, S. F. A., & Al Amosh, H. (2022). Measurement, determinants, and consequences of carbon disclosure: A systematic literature review. Sustainability, 14(20), Article 13475.

Borghei, Z. (2021). Carbon disclosure: A systematic literature review. Accounting & Finance, 61(4), 5255-5280.

Bui, B., Houqe, M. N., & Zaman, M. (2020). Climate governance and carbon disclosure: The role of board carbon expertise and external assurance. Business Strategy and the Environment, 29(8), 3467-3482.

Chariri, A., Januarti, I., & Yuyetta, E. N. (2023). ISO certification, firm characteristics and carbon emission disclosure. IOP Conference Series: Earth and Environmental Science, 1248(1), Article 012024.

Chithambo, L., & Tauringana, V. (2017). Corporate governance and greenhouse gas disclosure: A multi-theoretical approach. Corporate Governance: The International Journal of Business in Society, 17(2), 241-262.

Choi, B. B., Lee, D., & Psaros, J. (2013). An analysis of Australian company carbon emission disclosures. Pacific Accounting Review, 25(1), 58-79.

Citra, Y., & Sastradipraja, U. (2025). The influence of green investment and media exposure on carbon emission disclosure (Case study on oil, gas and coal energy subsector companies listed on the Indonesia Stock Exchange in 2021-2023). Journal of Accounting and Finance Management, 5(6), 1796-1810.

Cordova, C., Zorio-Grima, A., & Merello, P. (2018). Carbon disclosure by Latin American companies: An empirical study. Sustainability Accounting, Management and Policy Journal, 9(3), 295-321.

Datt, R. R., Luo, L., & Tang, Q. (2022). The impact of corporate carbon performance and media visibility on carbon disclosure quality. Business Strategy and the Environment, 31(7), 3120-3137.

Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures - a theoretical foundation. Accounting, Auditing & Accountability Journal, 15(3), 282-311.

Dewi, N. K. L. P., Muliati, N. K., & Putra, I. G. B. N. P. (2023). Pengaruh green investment dan media exposure terhadap carbon emission disclosure. Journal of Accounting and Finance Management, 4(4), 454-465.

Elafi, O. (2019). Building a stronger ISO 14001 - Establishing an effective environmental management system (EMS) standard. AIP Conference Proceedings, 2146(1), Article 020009.

Elsayih, J., Tang, Q., & Lan, Y. C. (2018). Corporate governance and carbon transparency: Australian evidence. Accounting & Finance, 58(4), 1145-1178.

Farida, L., & Dewi, R. (2023). The effect of green investment on the disclosure of carbon emissions from SRI-Kehati companies. Jurnal Ekuilnomi, 5(2), 865-878.

Garzon-Jimenez, R., & Zorio-Grima, A. (2021). Media coverage and greenhouse gas emissions reporting: Empirical evidence from European firms. Journal of Cleaner Production, 295, Article 126349.

Giannarakis, G., Zafeiriou, E., & Sariannidis, N. (2017). The impact of corporate governance on greenhouse gas emission disclosure: Evidence from the US. International Journal of Global Warming, 13(4), 438-459.

Guenther, E., Guenther, T., Schiemann, F., & Weber, G. (2016). Stakeholder relevance for reporting: Explanatory factors of carbon disclosure. Business & Society, 55(3), 361-397.

Hales, J. (2023). Carbon accounting and disclosure: The role of regulatory standards and stakeholder scrutiny. Accounting, Organizations and Society, 102, Article 101452.

Hammer, M., Pivo, G., & Shaffer, K. (2022). Corporate climate transparency and media attention: A longitudinal analysis. Journal of Business Ethics, 178(3), 743-761.

E-ISSN: **3047-2490**
Oktober 2025
Page: **173 - 185**

Hasan, M., & Mowla, K. G. R. (2024). Carbon accounting: A review of disclosure practices and assurance mechanisms. Jahangirnagar University Journal of Management Research, 7, 32-64.
He, X., Si, Z., & Yu, X. (2025). The influential factors of CSR reporting in China: A systematic literature review and future research agenda. Accounting, Finance & Governance Review, 34, 1-25.
IPCC. (2021). Climate change 2021: The physical science basis. Contribution of Working Group I to the Sixth Assessment Report. Cambridge University Press.
Jaggi, B., Allini, A., Macchioni, R., & Zagaria, C. (2018). The influence of board committee on carbon disclosure: An empirical study on Italian firms. Journal of Cleaner Production, 170, 659-671.
Kasim, A. (2015). Environmental management system (EMS): Postulating the value of its adoption to organizational learning. International Journal of Contemporary Hospitality Management, 27(6), 1233-1253.
Kilic, M., & Kuzey, C. (2019). The effect of corporate governance on carbon disclosure: Evidence from Turkey. International Journal of Climate Change Strategies and Management, 11(1), 35-53.
Liao, L., Luo, L., & Tang, Q. (2015). Gender diversity, board independence, environmental committee and greenhouse gas disclosure. The British Accounting Review, 47(4), 409-424.
Lina, L., & Rohmah, F. S. (2024). Ownership structure, board size, and carbon emission disclosures: Empirical evidence from ASEAN-5 countries. Jurnal Dinamika Akuntansi dan Bisnis, 11(2), 245-262.
Nilasakti, R., Aryani, Y. A., & Setiawan, D. (2024). Carbon emissions disclosure: An overview of research in Indonesia. Jurnal Dinamika Akuntansi dan Bisnis, 11(2), 219-238.
Nursulistyo, E., Rahmawati, R., Bandi, B., & Setiawan, D. (2023). The disclosure of carbon emission in Indonesia: A systematic literature review. Jurnal Dinamika Akuntansi dan Bisnis, 10(2), 241-260.
Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ, 372, Article n71.
Prado-Lorenzo, J. M., Rodriguez-Dominguez, L., Gallego-Alvarez, I., & Garcia-Sanchez, I. M. (2009). Factors influencing the disclosure of greenhouse gas emissions in industrial firms: An empirical analysis. Business Strategy and the Environment, 18(6), 393-407.
Purba, A. S., Hasriadi, H., & Ramli, R. (2024). Carbon emission disclosure in Southeast Asia: A systematic review and future research agenda. Journal of Economics, Finance and Accounting Studies, 6(3), 649-669.
Putri, A. V. A., & Yuliandhari, W. S. (2024). The influence of carbon performance, stakeholder pressure and ISO 14001 certification on carbon emission disclosure. Atestasi: Jurnal Ilmiah Akuntansi, 7(2), 868-884.
Rankin, M., Windsor, C., & Wahyuni, D. (2011). An investigation of voluntary corporate greenhouse gas emissions reporting: An Australian study. Accounting, Auditing & Accountability Journal, 24(8), 1037-1070.
Saadah, K., Setiawan, D., Probohudono, A. N., & Gantyowati, E. (2024). The role of women in top management in carbon emission disclosure: Evidence from banking entities in ASEAN. Journal of Open Innovation: Technology, Market, and Complexity, 10(3), Article 100330.
Sabil, S., Mediaty, M., & Pontoh, G. T. (2024). Corporate carbon emissions disclosure: A systematic review of the role of media exposure and disclosure practices. Preprints.org, Article 202406.1732.v1.
Solikhah, B., Yulianto, A., & Suryarini, T. (2021). The presence of ISO 14001 certification, environmental performance, and carbon emission disclosure in Indonesian manufacturing firms. IOP Conference Series: Earth and Environmental Science, 623(1), Article 012042.
Tutino, M., Arduini, S., Beck, T., & Capolini, F. (2025). Sustainable corporate governance: A structured literature review of the past 10 years. Corporate Ownership & Control, 22(3), 98-119.
Velte, P., Stawinoga, M., & Lueg, R. (2020). Carbon accounting and reporting: A systematic literature review of determinants and consequences. Journal of Cleaner Production, 256, Article 120599.
Zhang, Y. J., Peng, Y. L., Ma, C. Q., & Shen, B. (2020). Can environmental innovation inculcate firms toward carbon emission reduction? Evidence from China's listed firms. Journal of Cleaner Production, 258, Article 120721.
Zhang, Y. J., Xing, C., & Wang, Y. (2020). Overview of research on carbon information disclosure: Research trends, theoretical bases and influencing factors. Frontiers of Engineering Management, 7(1), 33-49.