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Environmental Disclosure and Green Legitimacy in PT KAI Subsidiaries

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ABSTRACT

This study analyzes how subsidiaries within a single Indonesian state-owned holding company adopt different environmental disclosure strategies to build and sustain organizational legitimacy. Using content analysis of the 2024 annual reports of four PT Kereta Api Indonesia (Persero) subsidiaries—KAI Logistik, KAI Commuter, KAI Bandara, and KAI Wisata—and guided by Legitimacy Theory and Signaling Theory, the research compares disclosure patterns based on GRI Standards. The findings reveal significant heterogeneity in disclosure practices across subsidiaries. KAI Logistik demonstrates the most comprehensive approach, reporting full-scope greenhouse gas emissions, holding ISO 14001:2015 certification, and providing carbon intensity metrics. KAI Commuter emphasizes infrastructure-based environmental initiatives such as green stations and renewable energy plans but lacks quantitative data. KAI Bandara introduces an innovative, consumer-oriented sustainability initiative (ReLIFE), yet its disclosures remain qualitative. Unexpectedly, KAI Wisata provides detailed, GRI-aligned quantitative environmental data, including energy use, fuel consumption, water usage, and disaggregated emissions, indicating that disclosure quality is driven more by organizational commitment than sector type. The study interprets these findings through two legitimacy models: a compliance-accountability model among transportation subsidiaries and a narrative-engagement model among service-oriented entities, with KAI Wisata representing a hybrid form. This research contributes to sustainability accounting by introducing the concept of intra-holding disclosure heterogeneity within state-owned enterprises in developing economies, challenging assumptions that sector determines disclosure quality, and suggesting that standardized GRI-based reporting across subsidiaries could reduce greenwashing risks and enhance overall corporate credibility

Keywords: *Environmental Disclosure, Green Legitimacy, Legitimacy Theory, Sustainability Reporting, State-Owned Enterprises*

1. INTRODUCTION

1.1. Global Landscape, Institutional Pressures, and the Communicative Turn in Sustainability

The contemporary business landscape has undergone a profound paradigmatic transformation, shifting from a narrowly conceived profit-maximization ethos toward a more holistic framework encapsulated in the Triple Bottom Line (TBL) philosophy—an integrated consideration of People, Planet, and Profit [1]. This transition reflects a broader societal recognition that corporations, particularly those operating under state ownership and public mandates, bear responsibilities that transcend shareholder returns. Within this evolving discourse, the emergence of Environmental, Social, and Governance (ESG) criteria as a dominant evaluative framework has fundamentally reconfigured the expectations imposed upon firms by investors, regulators, and civil society alike [2]. The shift from voluntary Corporate Social Responsibility (CSR) narratives to mandatory and standardized ESG reporting regimes signals a new era of corporate accountability, one in which environmental performance is no longer peripheral but constitutive of organizational legitimacy.

Crucially, this paradigmatic shift is not merely an accounting or governance phenomenon; it is fundamentally a *communicative* one. As Cornelissen [3] argues, corporate communication constitutes the primary mechanism through which organizations construct, negotiate, and sustain their relationships with diverse stakeholder groups. Environmental disclosure, in this regard, is not simply a technical reporting exercise but a form of *strategic corporate communication*—a deliberate, audience-aware act of message construction designed to shape stakeholder perceptions, manage reputational risk, and secure the organization's social

license to operate [4]. The present study is positioned at this intersection of sustainability governance and corporate communication, investigating how environmental disclosures function as strategically crafted communicative artifacts through which subsidiaries of a state-owned holding group seek to construct what is here termed "green legitimacy."

At the international level, the promulgation of the IFRS Sustainability Disclosure Standards—specifically IFRS S1 (General Requirements for Disclosure of Sustainability-related Financial Information) and IFRS S2 (Climate-related Disclosures)—has established a unified global baseline for sustainability reporting [5]. These standards compel corporations across all sectors to furnish transparent, decision-useful information regarding their climate-related risks and opportunities. For transportation enterprises, this regulatory architecture carries particularly acute implications, given that the sector accounts for approximately 23–25% of global energy-related carbon dioxide (CO_2) emissions according to the International Energy Agency [6], rendering it the second-largest contributor after energy generation.

Indonesia, as a signatory to the Paris Agreement and a member of the G20, has articulated an ambitious commitment to achieve Net Zero Emissions (NZE) by 2060 or sooner [7]. Within this context, state-owned enterprises (Badan Usaha Milik Negara/BUMN) are positioned not merely as economic actors but as instruments of national development policy, tasked with demonstrating exemplary environmental governance. The Ministry of State-Owned Enterprises (Kementerian BUMN) has progressively intensified its directives regarding sustainability reporting obligations for BUMN entities, mandating compliance with international standards such as the Global Reporting Initiative (GRI) Standards [8]. These institutional pressures collectively construct a communicative environment in which environmental disclosure is not optional but constitutes a strategic imperative—one that demands not only the production of environmental data but the skillful *framing* and *targeting* of environmental messages to diverse stakeholder audiences.

1.2. Theoretical Foundations: Legitimacy Theory, Signaling Theory, and Corporate Communication

The theoretical architecture underpinning the present study draws upon three complementary conceptual domains: Legitimacy Theory, Signaling Theory, and the corporate communication perspective on organizational discourse. Legitimacy Theory, as systematically articulated by Suchman [9], posits that organizational legitimacy constitutes a "generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (p. 574). Within this perspective, legitimacy is not a static attribute conferred upon organizations but rather a dynamic, strategic resource that must be actively constructed, maintained, and—when necessary—repaired through *deliberate communicative practices* [10]. This emphasis on communicative agency is critical: Legitimacy Theory, at its core, is a theory about how organizations *communicate* their way into social acceptance.

Deegan [11] further elaborates that corporate environmental reporting is seldom a neutral, disinterested act of information provision. Rather, it represents a strategically calibrated *communicative response* to perceived or actual threats to an organization's social license to operate. Corporations facing heightened environmental scrutiny tend to produce more extensive environmental disclosures as a means of signaling compliance, responsibility, and ecological awareness to relevant stakeholders [12]. This observation introduces a critical analytical tension between *substantive* and *symbolic* disclosure—a distinction that maps directly onto the corporate communication concept of *impression management*, defined by Hooghiemstra [13] as the strategic use of corporate reporting to influence stakeholder perceptions in ways that serve organizational interests. The greenwashing phenomenon, in which organizations produce environmentally favorable communications without corresponding behavioral changes [14], represents the pathological extreme of impression management in the environmental domain.

Complementing Legitimacy Theory, Signaling Theory provides an additional explanatory lens. Originally articulated by Spence [15] in the context of labor market information asymmetries, Signaling Theory posits that in conditions of information asymmetry, one party (the signaler) can convey credible information to another party (the receiver) through observable, costly actions or signals. Transposed to the domain of corporate sustainability reporting, this theory suggests that firms with genuinely superior environmental performance have incentives to differentiate themselves by voluntarily disclosing detailed, verifiable environmental information [16]. In the context of the present study, the GRI Standards—particularly GRI 305 (Emissions), GRI 302 (Energy), and GRI 306 (Waste)—serve as institutionally recognized signaling mechanisms through which subsidiaries of PT KAI may communicate the depth and breadth of their environmental commitments to external audiences [17].

The third theoretical strand—drawn from the corporate communication literature—provides the disciplinary lens that integrates these frameworks into a coherent analytical apparatus. Cornelissen [3] defines corporate communication as "a management function that offers a framework for the effective coordination of all internal and external communication with the overall purpose of establishing and maintaining favourable reputations with stakeholder groups upon which the organization is dependent" (p. 5). Environmental disclosure, viewed through this lens, is not merely a regulatory compliance artifact but a *communicative strategy* embedded within the broader organizational communication architecture. Van Riel and Fombrun [4] further argue that corporate communication encompasses three primary modes: management communication,

marketing communication, and organizational communication—all of which are discernible in the environmental disclosure practices of corporate entities. A transportation subsidiary's technical emissions report, for example, constitutes *organizational communication* directed at regulators and institutional stakeholders, while a tourism subsidiary's eco-branding campaign constitutes *marketing communication* targeting consumer audiences.

The confluence of these theoretical frameworks produces a powerful analytical apparatus. Legitimacy Theory explains *why* corporations disclose environmental information—to secure and maintain their social license to operate. Signaling Theory elucidates *how* the quality, specificity, and verifiability of those disclosures function as credible markers of environmental commitment. The corporate communication perspective illuminates *for whom* and *through what rhetorical strategies* environmental messages are constructed and delivered. Together, they enable the analysis of what this study terms "green legitimacy": the deployment of environmental disclosure as a strategic communicative instrument for securing public acceptance and differentiating corporate identity within a competitive and regulatory landscape.

1.3. Contextual Specificity: PT Kereta Api Indonesia and Its Subsidiary Architecture

PT Kereta Api Indonesia (Persero), hereinafter referred to as PT KAI, occupies a distinctive and strategically significant position within Indonesia's BUMN ecosystem. As the sole state-owned enterprise mandated to provide nationwide railway transportation services, PT KAI functions simultaneously as a public service provider entrusted with fulfilling its Public Service Obligation (PSO) and as a commercially oriented holding company expected to generate sustainable financial returns [18]. This dual mandate engenders a fundamental tension that pervades the organization's sustainability *communication* strategy: the imperative to maintain affordable, accessible transportation for the Indonesian public must be reconciled with the escalating demands for environmental accountability and green governance.

Over the past decade, PT KAI has evolved from a single-entity railway operator into a diversified holding group encompassing multiple subsidiaries with heterogeneous operational profiles. The transportation-oriented subsidiaries—such as PT KAI Logistik (KALOG), PT Kereta Commuter Indonesia (KCI), and PT Railink (KAI Bandara)—are characterized by asset-heavy, operationally intensive business models that involve significant energy consumption, rolling stock operations, freight logistics, and associated carbon emissions. In contrast, the tourism-oriented subsidiary—PT Kereta Api Pariwisata (KAI Wisata)—operates within a service-intensive, consumer-facing domain where environmental impacts are comparatively indirect but where stakeholder perceptions and brand reputation constitute critical commercial assets.

From a corporate communication perspective, this organizational architecture creates a *multi-audience communicative challenge*. Each subsidiary addresses fundamentally different primary stakeholders: KAI Logistik communicates with regulators, industrial clients, and certification bodies; KAI Commuter addresses millions of daily urban commuters and metropolitan governance authorities; KAI Bandara interfaces with airport authorities, air travelers, and tourism promotion agencies; and KAI Wisata engages tourists, travel agencies, and experiential consumers. The environmental disclosure produced by each subsidiary is therefore not merely a reflection of its operational reality but a *strategically framed message* tailored to the expectations, values, and information needs of its particular stakeholder ecosystem [3]. This communicative differentiation—the production of different environmental narratives by subsidiaries of the same holding group—constitutes the central phenomenon investigated by the present study.

This divergence generates a preliminary research hypothesis: transportation subsidiaries of PT KAI are expected to produce more extensive and technically specific environmental disclosures, driven by the materiality of their environmental impacts and the intensity of regulatory oversight—a communication strategy oriented toward what Suchman [9] terms *pragmatic* and *moral* legitimacy. The tourism subsidiary, conversely, is expected to emphasize qualitative, narrative-based disclosures designed to cultivate *cognitive* and *affective* legitimacy among consumers—an approach more closely aligned with marketing communication and brand-positioning strategies [4]. However, this hypothesis also raises the possibility that the tourism subsidiary may engage in more pronounced symbolic disclosure, introducing the specter of green legitimacy as a predominantly communicative, rather than substantive, achievement.

1.4. Research Gap, Novelty, and Justification

A critical examination of the extant literature reveals a significant and persistent lacuna at the intersection of sustainability accounting and corporate communication. The overwhelming majority of comparative studies on environmental reporting have adopted inter-industry or cross-sectoral designs, examining differences in disclosure practices between fundamentally distinct industries [12], [19], [11]. While such studies have produced valuable insights, they have generally overlooked a more granular level of analysis: *intra-group* or *intra-holding* comparisons, in which subsidiaries operating under a single parent company but in different sectors are examined for systematic variations in their environmental *communication* strategies. Moreover, the corporate communication dimension of environmental disclosure—how disclosures are framed, targeted, and differentiated across audiences—has received insufficient attention in the sustainability accounting literature, which has tended to treat disclosures as informational outputs rather than communicative acts [13].

This gap is particularly consequential in the context of BUMN holding structures in developing countries such as Indonesia. BUMN entities operate within a unique institutional milieu that combines elements of commercial enterprise, public policy instrument, and national development agent. The regulatory and societal expectations imposed upon these entities are qualitatively different from those faced by purely private-sector firms, yet the existing literature has largely failed to interrogate how these expectations are differentially interpreted and *communicated* by subsidiaries with divergent operational mandates within the same holding group. Studies on environmental disclosure in the Indonesian BUMN context remain embryonic, with most existing research focused on parent-company level analysis rather than subsidiary-level disaggregation [20].

The novelty of the present study resides precisely in this analytical lacuna. By conducting a comparative investigation of environmental disclosure practices across transportation and tourism subsidiaries within the PT KAI holding group, this research contributes to the literature in four distinctive ways. First, it introduces the concept of *intra-holding disclosure heterogeneity*—the proposition that subsidiaries within a single corporate group may adopt fundamentally different communicative strategies for environmental reporting in response to their specific operational contexts, stakeholder environments, and legitimacy imperatives. Second, it extends the application of Legitimacy Theory and Signaling Theory to the under-examined domain of BUMN holding structures in emerging economies. Third, it explicitly bridges the sustainability accounting and corporate communication literatures by analyzing environmental disclosures not merely as informational artifacts but as *strategically constructed communicative acts* differentiated by audience, rhetorical mode, and legitimacy objective. Fourth, it responds to growing calls for context-sensitive, institution-aware research that accounts for the regulatory, cultural, and organizational particularities of developing-country settings [21], [22].

In sum, the present study argues that the strategic deployment of environmental disclosure—what is here conceptualized as "strategizing green legitimacy"—cannot be understood as a monolithic corporate exercise. Rather, it is a differentiated, context-dependent *communicative practice* shaped by the interplay of sectoral pressures, organizational identity, stakeholder expectations, and the institutional architecture of the holding group. By illuminating these dynamics within the PT KAI ecosystem, this research offers theoretical contributions to the fields of sustainability accounting *and* corporate communication, and practical implications for BUMN governance and environmental policy formulation in Indonesia.

2. LITERATURE REVIEW

2.1 Environmental Disclosure: Conceptual Foundations and Evolving Standards

Environmental disclosure, broadly defined, refers to the systematic provision of information by corporations regarding the environmental consequences of their operations, encompassing both quantitative metrics (e.g., greenhouse gas emissions, energy consumption, waste generation) and qualitative narratives (e.g., environmental policies, stakeholder engagement practices, future sustainability commitments) [23]. The evolution of environmental disclosure practice has been profoundly shaped by the progressive institutionalization of reporting frameworks, among which the Global Reporting Initiative (GRI) Standards occupy a preeminent position. The GRI Standards provide a comprehensive, modular architecture for sustainability reporting, with topic-specific standards such as GRI 302 (Energy), GRI 303 (Water and Effluents), GRI 305 (Emissions), and GRI 306 (Waste) offering granular guidance on the measurement and communication of environmental performance indicators [17].

The scholarly discourse on environmental disclosure has traversed several distinct phases. Early studies examined the motivations and determinants of corporate environmental reporting, identifying firm size, industry affiliation, profitability, and media visibility as significant predictors of disclosure extent [24], [25]. Subsequent research shifted attention toward the *quality* of disclosure, distinguishing between "hard" disclosures—quantifiable, verifiable, and specific—and "soft" disclosures—rhetorical, aspirational, and non-verifiable—arguing that the latter may function as instruments of impression management rather than genuine accountability [19], [26]. More recently, the promulgation of IFRS S1 and IFRS S2 by the International Sustainability Standards Board (ISSB) has established a unified global baseline for climate-related financial disclosures [5], while in Indonesia, the Otoritas Jasa Keuangan (OJK) issued Regulation No. 51/POJK.03/2017 mandating sustainability reporting for listed entities [27]. These developments underscore the transition of environmental disclosure from a voluntary corporate virtue to a compulsory governance mechanism.

2.2 Legitimacy Theory: Strategic Disclosure as Organizational Survival

Legitimacy Theory has emerged as one of the most extensively deployed theoretical frameworks in the sustainability accounting and reporting literature. Rooted in the broader tradition of organizational institutionalism, the theory posits that organizations exist within a socially constructed "social contract" with the communities and stakeholders upon whom their continued operation depends [11], [28]. When an incongruence arises between an organization's conduct and prevailing societal expectations—a "legitimacy gap"—the organization faces potential sanctions ranging from

reduced consumer patronage to regulatory intervention [9].

Suchman's [9] seminal typology delineates three forms of organizational legitimacy: *pragmatic legitimacy*, grounded in self-interested stakeholder calculations; *moral legitimacy*, predicated on normative evaluations of whether the organization is "doing the right thing"; and *cognitive legitimacy*, arising when the organization's existence and activities are taken for granted as natural and necessary. Each form implies distinct *communicative strategies*. Pragmatic legitimacy may be secured through disclosures demonstrating tangible benefits, while moral legitimacy demands evidence of genuine ethical commitment. Cognitive legitimacy requires that the organization's environmental behavior becomes so embedded in public consciousness that it ceases to be questioned.

O'Donovan [10] identifies three strategic maneuvers for legitimacy management: *gaining*, *maintaining*, and *repairing* legitimacy. Environmental disclosure serves as a primary vehicle for all three, although the content, tone, and rhetorical emphasis differ depending on the specific objective being pursued. This variation in communicative approach is precisely what makes Legitimacy Theory valuable as an analytical lens for the present study: it predicts that subsidiaries facing different legitimacy pressures will produce qualitatively different environmental communications, even within the same holding group.

2.3 Signaling Theory: Disclosure Quality as a Credibility Mechanism

Signaling Theory, originally formulated by Spence [15], offers a complementary lens by positing that in markets characterized by information asymmetry, the better-informed party can communicate its unobservable qualities through costly, credible signals. Transposed to corporate environmental reporting, the theory suggests that firms with genuinely superior environmental performance can distinguish themselves by voluntarily disclosing detailed, specific, and verifiable information [16]. Such disclosures function as credible signals precisely because they impose costs—the costs of measurement, verification, and potential reputational exposure if performance falls short [19].

The integration of Signaling Theory with Legitimacy Theory enriches the analytical framework by introducing a qualitative dimension: Legitimacy Theory explains the *motivation* behind disclosure (the need to close the legitimacy gap), while Signaling Theory explains the *mechanism* through which disclosure achieves its intended effect (the emission of costly, credible signals). For the comparative study of PT KAI's subsidiaries, this integration generates testable propositions regarding disclosure quality: transportation subsidiaries, which possess more extensive environmental monitoring infrastructure, are expected to emit "high-cost" signals through detailed metrics, while tourism subsidiaries may emit "lower-cost" signals through qualitative narratives.

2.4 Corporate Communication Perspective: Environmental Disclosure as Strategic Messaging

While Legitimacy Theory and Signaling Theory provide robust explanations for the motivations and mechanisms of environmental disclosure, they do not fully account for the *communicative architecture* through which disclosures are constructed, targeted, and delivered to specific audiences. The corporate communication literature addresses this gap by conceptualizing organizational disclosures as strategic communicative acts embedded within broader reputation management frameworks [3], [4].

Cornelissen [3] defines corporate communication as a management function that coordinates all internal and external communication to establish and maintain favorable reputations with stakeholder groups upon which the organization depends. Within this framework, environmental disclosure is not merely an accounting output but a *communicative strategy* that involves deliberate choices about message content (what to disclose), rhetorical mode (how to frame it), channel selection (where to place it within the report architecture), and audience targeting (for whom the message is primarily intended). Van Riel and Fombrun [4] distinguish three modes of corporate communication—management communication, marketing communication, and organizational communication—each of which manifests differently in environmental reporting. A technical emissions inventory directed at regulators exemplifies organizational communication; an eco-tourism branding narrative directed at consumers exemplifies marketing communication; and a CEO's sustainability commitment letter exemplifies management communication.

The concept of *framing* is particularly relevant to the present study. Entman [29] defines framing as the process of selecting certain aspects of a perceived reality and making them more salient in a communicating text, so as to promote a particular problem definition, causal interpretation, moral evaluation, or treatment recommendation. In the context of environmental disclosure, framing determines how an organization's environmental performance is *presented* and *interpreted* by stakeholders. A logistics subsidiary may frame its carbon emissions within a "modal shift" narrative (rail is greener than road), while a tourism subsidiary may frame its environmental initiatives within an "experiential sustainability" narrative (travel that gives back). These framing choices are not incidental; they reflect deliberate communicative strategies designed to resonate with the values, expectations, and cognitive schemas of targeted stakeholder groups [30].

Hooghiemstra [13] further bridges corporate communication and legitimacy research by arguing that corporate social and environmental reporting can be understood as a form of *impression management*—the strategic presentation of organizational information designed to influence stakeholder perceptions. This perspective does not imply that all environmental communication is manipulative; rather, it recognizes that

the *selection*, *emphasis*, and *framing* of environmental information are inherently communicative acts shaped by organizational interests. The analytical challenge, then, is to distinguish between impression management that accompanies genuine environmental performance (substantive communication) and impression management that substitutes for it (symbolic communication). This distinction is central to the present study's investigation of intra-group disclosure heterogeneity within the PT KAI holding structure.

2.5 Environmental Disclosure in the Transportation Sector: Global and Indonesian Perspectives

The transportation sector occupies a uniquely prominent position within the global environmental disclosure discourse, attributable to its substantial contribution to anthropogenic greenhouse gas emissions [6]. The existing literature reveals several consistent patterns. Transportation firms operating in environmentally sensitive regulatory environments tend to disclose more extensively than those in less regulated contexts [12]. The quality of disclosure varies substantially across transportation sub-sectors, with aviation and maritime companies generally producing more detailed emissions inventories than road or rail operators [31]. State-owned transportation enterprises in developing countries face distinctive disclosure challenges, including limited institutional capacity for environmental monitoring, competing public service mandates, and the political instrumentalization of sustainability narratives [20], [32].

In the Indonesian context, research on environmental disclosure by transportation BUMN remains notably sparse. Existing studies have predominantly focused on the mining and plantation sectors, while transportation has received comparatively limited scholarly attention [33]. Among the studies that do address Indonesian transportation enterprises, the analytical scope has been confined to parent-company level annual reports, with little disaggregation at the subsidiary level—a gap this study directly addresses.

2.6 Greenwashing and the Dialectic of Symbolic versus Substantive Communication

A critical dimension of the environmental disclosure literature concerns the distinction between *substantive* and *symbolic* disclosure—a dichotomy that, from a corporate communication standpoint, represents the tension between *authentic organizational communication* and *strategic impression management* [13]. Substantive disclosures reflect genuine changes in organizational behavior and are characterized by specificity, verifiability, and GRI alignment [19]. Symbolic disclosures are primarily communicative acts designed to create an impression of responsibility without corresponding behavioral changes—vague, aspirational, and divorced from measurable outcomes [26], [14].

The greenwashing phenomenon poses a particularly acute challenge for state-owned enterprises in developing countries, where institutional oversight may be weaker and political incentives for projecting environmental progressiveness may be substantial [34]. Walker and Wan [35] argue that firms engaging primarily in symbolic environmentalism face long-term legitimacy risks if the gap between their communicated commitments and actual performance becomes apparent. From a corporate communication perspective, this risk can be understood as a *credibility crisis*—a breakdown in the perceived authenticity of the organization's environmental messaging that undermines the very stakeholder trust the communication was designed to build [3].

2.7 Intra-Group Disclosure Heterogeneity: An Underexplored Frontier

The preponderance of comparative environmental disclosure research has adopted inter-industry designs, examining differences between fundamentally distinct industries [12], [19]. This has largely neglected *intra-holding* or *intra-group* comparisons among subsidiaries operating under a single corporate parent. This gap is theoretically significant: it leaves unexamined whether environmental disclosure strategies are primarily determined by group-level policies (a "top-down" model) or by subsidiary-level operational realities and *communicative contexts* (a "bottom-up" model). If subsidiary-level factors dominate, one would expect significant *communicative heterogeneity*—different subsidiaries telling fundamentally different environmental stories to different audiences, using different rhetorical strategies, even under the same corporate umbrella.

Practically, the absence of intra-group studies limits the capacity of regulators and investors to evaluate the environmental governance coherence of corporate holding groups. A parent company may present a consolidated sustainability report that masks significant disparities in environmental *communication quality* among its subsidiaries—what Rodrigue et al. [36] describe as a potential form of "consolidated greenwashing." The present study directly addresses this gap by conducting a comparative analysis of environmental *communication* practices across transportation and tourism subsidiaries within the PT KAI holding structure.

2.8 Conceptual Framework

Drawing upon the theoretical and empirical foundations reviewed above, this study proposes an integrated conceptual framework that positions environmental disclosure as a *strategic communicative practice* mediated by legitimacy management strategies [9], [10], signaling credibility mechanisms [16], and communicative framing choices [29], [3], and moderated by subsidiary-level operational characteristics (sector type, asset intensity, stakeholder proximity). The framework posits that subsidiaries within the PT KAI group adopt differentiated *communication strategies* for environmental reporting in response to the unique confluence of institutional pressures, stakeholder

expectations, and rhetorical opportunities that characterize their respective business domains. Transportation subsidiaries are hypothesized to engage in materially driven, compliance-oriented *organizational communication* aimed at securing pragmatic and moral legitimacy, while the tourism subsidiary is hypothesized to pursue narratively driven, brand-oriented *marketing communication* aimed at cultivating cognitive legitimacy and affective stakeholder engagement. The empirical investigation of these propositions constitutes the central objective of this study.

3. METHOD

3.1 Research Design and Approach

This study adopts a *qualitative research design* employing *content analysis* as its primary methodological instrument. Content analysis, defined as a systematic and replicable technique for compressing large volumes of text into fewer content categories based on explicit rules of coding [37], is particularly well-suited for examining corporate environmental disclosures, where the objects of inquiry are publicly available textual and numerical artifacts embedded within official corporate documents. The study is situated within the interpretive-critical tradition of sustainability accounting research, which recognizes that corporate disclosures are strategically constructed texts reflecting organizational interests, power dynamics, and legitimacy imperatives [22].

The comparative dimension of the research design is operationalized through a structured cross-sectional analysis for the fiscal year 2024, juxtaposing environmental disclosure practices across two subsidiary categories within the PT Kereta Api Indonesia (Persero) holding group: (a) *transportation subsidiaries* (high-impact, asset-heavy entities comprising PT KAI Logistik, PT Kereta Commuter Indonesia, and PT Railink/KAI Bandara), and (b) the *tourism/service subsidiary* (service-oriented, consumer-facing entity, PT Kereta Api Pariwisata/KAI Wisata). The adoption of a single-year cross-sectional design is justified on methodological and practical grounds: it ensures temporal consistency across all four documentary sources, enables direct apple-to-apple comparison of disclosure content produced under identical macroeconomic and regulatory conditions, and reflects the exploratory character of this study as the first intra-holding environmental disclosure comparison within the Indonesian BUMN railway sector.

3.2 Data Sources

The empirical corpus of this study is derived exclusively from the 2024 Annual Reports of four PT KAI subsidiaries, obtained as publicly available corporate documents. These reports constitute the primary and sole data source for the content analysis, ensuring methodological consistency and analytical focus. Table 1 presents a comprehensive overview of the documentary corpus.

Table 1. *Documentary Corpus: Annual Reports of PT KAI Subsidiaries (Fiscal Year 2024)*

No.	Document	Description	Report Type
1	Annual Report 2024 – PT KAI Logistik	Standalone annual report of the freight logistics subsidiary, including sustainability roadmap, ISO 14001 certification, GHG emissions (Scope 1, 2, 3), and TJSL programs.	Laporan Tahunan 2024 (Annual Report)
2	Combined Report 2024 – PT Kereta Commuter Indonesia (KAI Commuter)	Combined annual report of the commuter rail subsidiary, including Green Commuter strategy, TJSL/CSR activities, and sustainability governance.	Combined Report 2024
3	Laporan Tahunan 2024 – PT Railink (KAI Bandara)	Annual report of the airport rail subsidiary, including ReLIFE sustainability initiative, TJSL activities, and GCG assessment.	Laporan Tahunan 2024 (Annual Report)
4	Laporan Tahunan Terintegrasi 2024 – PT Kereta Api Pariwisata (KAI Wisata)	Integrated annual report of the tourism subsidiary, including GRI-aligned environmental performance data (energy, water, emissions, waste), sustainability report chapter, and TJSL fund distribution.	Laporan Tahunan Terintegrasi 2024 (Integrated Annual Report)

The selection of these four subsidiaries was guided by two criteria: first, their representation of the two principal operational domains within the PT KAI holding structure—freight logistics, urban mass transit, and airport rail connectivity (transportation sector) versus rail-based tourism and hospitality services (tourism/service sector); and second, the public availability of their 2024 Annual Reports at the time of data collection. Each report was examined in its entirety, with particular attention directed to dedicated environmental disclosure sections, including Sustainability Report chapters (*Laporan Keberlanjutan*), Social and Environmental Responsibility (TJSL) sections, environmental performance data tables, and sustainability governance descriptions.

It is important to note that the four reports differ in format and depth. KAI Wisata published an Integrated Annual Report explicitly structured around GRI Standards indicators, while KAI Logistik produced a standalone Annual Report containing a detailed sustainability roadmap and ISO certification documentation. KAI Commuter issued a Combined Report integrating operational and governance information, and KAI Bandara produced a standard Annual Report with a dedicated sustainability initiatives section. These format variations are not treated as methodological limitations but rather as empirical data points that themselves reflect differential organizational commitments to sustainability reporting standardization—a phenomenon directly relevant to the study's analytical objectives.

3.3 Analytical Instrument: GRI-Based Content Analysis Checklist

The analytical instrument deployed in this study is a structured content analysis checklist constructed on the basis of the GRI Standards [17]. The checklist is differentiated by subsidiary sector to reflect the distinct materiality profiles of transportation and tourism/service operations. Each disclosure item is assessed on a three-tier ordinal scale: *Disclosed* (✓) indicating the item is reported with specific quantitative or qualitative data; *Partially Disclosed* (○) indicating the item is mentioned but lacks specificity or completeness; and *Not Disclosed* (✗) indicating the item is absent from the reviewed document. This tripartite classification aligns with established content analysis protocols in the environmental disclosure literature [12], [19].

Table 2 presents the completed checklist for the three transportation subsidiaries, and Table 3 presents the completed checklist for the tourism/service subsidiary (KAI Wisata). Unlike the prospective checklist instruments presented in earlier methodological drafts, these tables reflect the *actual findings* derived from the content analysis of the 2024 Annual Reports, thereby serving simultaneously as analytical instruments and as summary presentations of disclosure results.

Table 2. *GRI-Based Environmental Disclosure Checklist – Transportation Subsidiaries (Completed)*

GRI Indicator	Disclosure Item	KAI Logistik	KAI Commuter	KAI Bandara
GRI 302-1	Energy consumption within the organization	✓ Disclosed (biodiesel, solar panels)	○ Partial (electric traction referenced)	✗ Not disclosed
GRI 302-3	Energy intensity ratio	✓ Disclosed (0.02 tCO_2eq/ton)	✗ Not disclosed	✗ Not disclosed
GRI 305-1	Direct GHG emissions (Scope 1)	✓ Disclosed	✗ Not disclosed	✗ Not disclosed
GRI 305-2	Indirect GHG emissions (Scope 2)	✓ Disclosed	✗ Not disclosed	✗ Not disclosed
GRI 305-3	Other indirect GHG emissions (Scope 3)	✓ Disclosed (expanded 2024)	✗ Not disclosed	✗ Not disclosed
GRI 305-4	GHG emissions intensity	✓ Disclosed	✗ Not disclosed	✗ Not disclosed
GRI 306-1/3	Waste generation and management	✓ Disclosed (B3 waste: 540.12 K tons)	○ Partial (seat management)	○ Partial (plastic reduction)
GRI 303-5	Water consumption	✗ Not disclosed	○ Partial (drinking water at 16 stations)	○ Partial (Green Hydration)

ISO 14001	Environmental Management System certification	✓ Certified (valid to 2026)	✗ Not certified/disclosed	✗ Not certified/disclosed

Table 3. *GRI-Based Environmental Disclosure Checklist – Tourism/Service Subsidiary: KAI Wisata (Completed)*

GRI Indicator / Theme	Disclosure Item	KAI Wisata	Notes
GRI 302-1	Energy consumption (electricity and fuel)	✓ Disclosed: 150,514 kWh; 7,800 L Pertamax	Measured at Head Office; PLN-supplied electricity
GRI 302-3	Energy intensity	✓ Disclosed: 0.0013 GJ/Rp million revenue	Calculated from total energy / revenue
GRI 305-1	Direct GHG emissions (Scope 1)	✓ Disclosed: 18,486.47 kg CO_2e	IPCC 2019 Tier-1; EF 69,300 kg/TJ for gasoline
GRI 305-2	Indirect GHG emissions (Scope 2)	✓ Disclosed: 140,580.07 kg CO_2e	Grid EF 0.934 kgCO_2/kWh (ESDM/PLN RUPTL)
GRI 305-3	Other indirect emissions (Scope 3)	✗ Not disclosed (acknowledged)	Business travel by air not yet calculated
GRI 303-5	Water consumption	✓ Disclosed: 2,030 m^3	PDAM-sourced; Head Office measurement
GRI 306-2	Waste management and plastic reduction	✓ Disclosed: Non-B3 waste; Rp3.6M env. cost; plastic bottle & paper cup initiatives	No hazardous waste generated
Environmental Education	Green tourism campaigns for passengers	○ Partial: eco-friendly materials promotion; employee green behavior campaigns	Referenced in sustainability commitment section
Digital / Paperless	Paperless ticketing and digital transformation	✗ Not specifically disclosed	Paper reduction through reuse programs only

3.4 Data Analysis Procedure

The data analysis procedure follows a four-stage sequential protocol designed to ensure systematic rigor and analytical transparency:

Stage 1 – Document Compilation and Familiarization.

The four Annual Reports were obtained and converted to machine-readable text format to facilitate systematic keyword searching and content extraction. Each document was read in its entirety to establish an initial understanding of its structure, scope, and the location of environmental disclosure content within the broader report architecture.

Stage 2 – Systematic Keyword-Based Extraction.

A targeted keyword search was conducted across all four documents using a predefined lexicon of environmental disclosure terms, including: *lingkungan hidup, environmental, emisi, emission, GHG, Scope 1, Scope 2, energi, energy, listrik, electricity, BBM, fuel, limbah, waste, B3, hijau, green, karbon, carbon, TJSL, CSR, ISO 14001, PROPER, sustainability, keberlanjutan, paperless, sampah, plastic, water, air bersih*. All passages identified through this process were extracted and catalogued by subsidiary and thematic category.

Stage 3 – Coding Against GRI Checklist.

The extracted passages were systematically coded against the GRI-based checklist instruments (Tables 2 and 3). For each disclosure item, the content was evaluated to determine whether the subsidiary provided quantitative data (Disclosed), mentioned the topic without specific metrics (Partially Disclosed), or omitted the topic entirely (Not Disclosed). The coding process was conducted with reference to the original document text to ensure accuracy and contextual fidelity.

Stage 4 – Comparative Mapping and Theoretical Interpretation.

The coded results were organized into a comparative matrix juxtaposing the disclosure profiles of all four subsidiaries across all GRI indicators and

thematic categories. This matrix was then interpreted through the dual theoretical lenses of Legitimacy Theory [9], [10], [11] and Signaling Theory [15], [16], examining whether observed differences in disclosure extent and quality are consistent with theoretical predictions regarding legitimacy management strategies and signaling credibility mechanisms across subsidiaries with heterogeneous operational profiles.

3.5 Trustworthiness and Methodological Limitations

Credibility is enhanced through the use of a standardized analytical instrument grounded in the internationally recognized GRI Standards, systematic keyword-based extraction ensuring comprehensive coverage of relevant content, and the transparent presentation of completed checklists that enable readers to trace analytical judgments back to specific documentary evidence. *Transferability* is supported by the detailed description of the research context, data sources, and analytical procedures, enabling readers to assess the applicability of findings to comparable BUMN holding structures. *Dependability* is maintained through the documentation of the keyword lexicon, coding criteria, and the four-stage analytical procedure.

The study acknowledges several limitations inherent in its design. First, the reliance on publicly available Annual Reports means that internal environmental management practices not disclosed in official documents remain outside the analytical scope. Second, the content analysis method captures the presence and quality of disclosures but cannot independently verify the accuracy of disclosed information. Third, the single-year observation window (fiscal year 2024), while ensuring temporal consistency and enabling direct cross-subsidiary comparison, does not capture longitudinal trends in environmental reporting practices. Fourth, the study does not include the Sustainability Report of PT KAI (Persero) as the parent company, focusing exclusively on subsidiary-level Annual Reports; the consolidated holding-level perspective therefore remains a direction for future research. These limitations are acknowledged as boundaries of the present investigation and as opportunities for subsequent studies employing complementary methodological approaches such as interviews with sustainability managers, longitudinal panel designs, or multi-holding comparative frameworks.

4. FINDINGS AND DISCUSSION

4.1 Environmental Disclosure Mapping: An Overview of Subsidiary-Level Reporting Patterns

The content analysis of the 2024 Annual Reports of four PT KAI subsidiaries—PT KAI Logistik, PT Kereta Commuter Indonesia (KAI Commuter), PT Railink (KAI Bandara), and PT Kereta Api Pariwisata (KAI Wisata)—reveals a heterogeneous landscape of environmental disclosure practices across the holding group. Each subsidiary demonstrates a distinct approach to environmental reporting, shaped by its operational profile, stakeholder ecosystem, and perceived legitimacy imperatives. The following subsections present the findings for each subsidiary, followed by a consolidated comparative analysis.

4.1.1 PT KAI Logistik: The Most Comprehensive Disclosure Architecture

Among the four subsidiaries examined, KAI Logistik demonstrates the most advanced and technically sophisticated environmental disclosure framework. The company's 2024 Annual Report provides quantitative emissions data across all three scopes of greenhouse gas (GHG) accounting—a distinction unique among the subsidiaries studied. KAI Logistik reports a carbon emission intensity of 0.02 tonnes CO_2eq per ton of goods transported, reflecting a systematic effort to benchmark environmental performance against operational output. The company explicitly references its expanded emissions reporting in 2024 to encompass Scope 1, 2, and 3 emissions, signaling a commitment to comprehensive carbon accounting that exceeds the reporting practices of its sister entities within the KAI Group.

Beyond emissions quantification, KAI Logistik discloses concrete decarbonization initiatives, including the utilization of biodiesel fuel, the installation of solar panels at operational facilities, and the implementation of go-green practices through document digitalization. The subsidiary holds ISO 14001:2015 certification for Environmental Management Systems—issued by Sucofindo and valid until July 2026—making it the only entity within the sample that possesses formal third-party environmental certification. Furthermore, KAI Logistik's sustainability roadmap explicitly targets external recognition through PROPER ratings from the Ministry of Environment and Forestry (KLHK), ISRA ARA assessments, and OJK ESG scores, indicating a strategically oriented approach to environmental legitimacy construction.

The subsidiary's environmental portfolio also includes its B3 hazardous waste transportation service, which handled 540.12 thousand tons of hazardous materials in 2024 under strict compliance with KLHK and Ministry of Transportation regulations. This operational dimension positions KAI Logistik at the intersection of environmental risk management and commercial service provision, creating a dual incentive for comprehensive disclosure. The TJSL fund allocation of Rp1.12 billion further underscores the subsidiary's material commitment to social and environmental programming. Externally, KAI Logistik received the Best CSR in Logistic Sector 2024 award from The Iconomics and the TOP CSR Awards 2024 (#Star 4), providing third-party validation of its sustainability efforts.

4.1.2 PT Kereta Commuter Indonesia (KAI Commuter): Infrastructure-Led Green Strategy

KAI Commuter presents a qualitatively distinct disclosure approach centered on infrastructure transformation rather than quantitative emissions accounting. The subsidiary's 2024 Combined Report articulates a "Green Commuter" strategy as one of its five core strategic pillars—alongside Operation Excellence,

Customer Experience, Integration Collaboration, and Expansion. This strategic positioning elevates environmental sustainability from a peripheral reporting obligation to a core element of the company's business architecture.

The Green Commuter strategy encompasses five concrete programmatic elements: (1) solar cell installation plans at rail yards (Balai Yasa) and depots; (2) the construction of 25 environmentally friendly stations; (3) the Green Office initiative and the greening of Griya Karya employee facilities; (4) RDS V3 document digitization; and (5) the provision of bicycle parking and green spaces at stations. In 2024, KAI Commuter reported the implementation of five green stations and depots, the provision of clean drinking water facilities at 16 stations, and the establishment of free bicycle parking to promote green mobility lifestyles.

However, a notable gap in KAI Commuter's disclosure framework is the absence of quantitative environmental performance metrics. The Annual Report does not provide specific data on GHG emissions (Scope 1, 2, or 3), energy consumption in kilowatt-hours or liters of fuel, water usage volumes, or waste generation quantities. This omission is particularly significant given that KAI Commuter operates the electrified Commuter Line (KRL) network serving the Jakarta metropolitan area—a system that, by virtue of its electric traction, inherently carries a distinct emissions profile (predominantly Scope 2 from purchased electricity) compared to diesel-powered rail operations. The subsidiary's sustainability governance is managed under the Corporate Secretary Division, and it references ISO 26000 guidelines for CSR implementation. KAI Commuter received a Gold award in the Social Pillar and a Silver award in the Environmental Pillar at the TJSL & CSR Award 2024.

4.1.3 PT Railink (KAI Bandara): Narrative Innovation through the ReLIFE Initiative

KAI Bandara's 2024 Annual Report reveals a disclosure strategy that is distinctive in its emphasis on narrative innovation and consumer-facing environmental branding. The centerpiece of the subsidiary's environmental communication is the ReLIFE initiative an integrated sustainability program whose acronym encapsulates five values: Rail (environmentally friendly transportation), Environment (focus on sustainability), Innovation (technology-driven carbon education), Futuristic (green lifestyle promotion), and Efficient (energy-efficient mobility solutions).

The ReLIFE program is operationalized through three primary pillars. First, *Green Hydration* involves the installation of drinking water dispensers at Medan and Yogyakarta airport train stations to reduce dependence on single-use plastic bottles. Second, the *EcoMeter* application provides data-driven environmental education to airport train passengers, enabling them to track CO_2 savings (in kilograms) compared to private vehicle usage, incorporating gamification and leaderboard features. Third, the *Tree Planting Movement* involves periodic tree planting events at station areas, framed as carbon offset activities conducted in collaboration with the KAI Group and Yogyakarta International Airport.

Despite the conceptual sophistication of the ReLIFE initiative, KAI Bandara's Annual Report is notably devoid of quantitative environmental performance data. No figures are provided for GHG emissions, energy consumption, water usage, or waste generation. The environmental narrative is entirely qualitative and aspirational, centered on consumer engagement and behavioral change rather than operational accountability. The subsidiary does not report ISO 14001 certification, PROPER ratings, or specific GRI indicator compliance.

4.1.4 PT Kereta Api Pariwisata (KAI Wisata): Emerging Quantitative Disclosure in Tourism

KAI Wisata's 2024 Integrated Annual Report presents a notably comprehensive environmental disclosure framework that challenges the initial expectation of tourism subsidiaries producing predominantly qualitative disclosures. The company reports specific quantitative data across multiple GRI-aligned indicators, including electricity usage (150,514 kWh), fuel consumption (7,800 liters of Pertamax gasoline), water usage (2,030 m^3), and paper usage (36 reams). GHG emissions are disaggregated into Scope 1 (18,486.47 kg CO_2e from fuel combustion, calculated using the IPCC 2019 Tier-1 methodology) and Scope 2 (140,580.07 kg CO_2e from purchased electricity, using the ESDM grid emission factor of 0.934 kg CO_2/kWh). Total GHG emissions for 2024 were 159,066.54 kg CO_2e, with an energy intensity of 0.0013 GJ per Rp million of revenue.

KAI Wisata explicitly acknowledges that Scope 3 emissions have not yet been calculated, demonstrating transparency regarding its carbon accounting boundaries. The subsidiary's environmental cost realization in 2024 was Rp3,600,000 for non-hazardous waste management. On the qualitative dimension, KAI Wisata's disclosure encompasses single-use plastic bottle reduction on the Panoramic Train, paper usage reduction through reuse programs, and energy efficiency initiatives including electric and hybrid operational vehicles. The TJSL fund distribution was Rp70 million.

4.2 Consolidated Comparative Analysis

Table 4 presents a consolidated comparison of environmental disclosure content across the four subsidiaries, organized by thematic disclosure categories derived from the GRI Standards framework.

Table 4. *Comparative Environmental Disclosure Mapping across PT KAI Subsidiaries (2024)*

Disclosure Category	KAI Logistik	KAI Commuter	KAI Bandara	KAI Wisata
GHG Emissions (Scope 1 & 2)	Disclosed (Scope 1, 2, 3);	Not quantitatively	Qualitative only (carbo	Scope 1: 18,486 kg CO2e; Scope 2:

	Intensity: 0.02 tCO2eq/ton	disclosed	n offset narrative)	140,580 kg CO2e
Scope 3 Emissions	Disclosed (expanded 2024)	Not disclosed	Not disclosed	Not disclosed (acknowledged)
Energy Consumption	Biodiesel; solar panels disclosed	Electric traction (KRL); solar cell plans	Qualitative (energy-efficient narrative)	150,514 kWh electricity; 7,800 L fuel
Energy Intensity	0.02 tCO2eq/ton goods	Not disclosed	Not disclosed	0.0013 GJ/Rp million
Water Usage	Not disclosed	Drinking water at 16 stations (qualitative)	Green Hydration dispensers (qualitative)	2,030 m3
Waste Management	B3 waste transport: 540.12 K tons; KLHK compliance	Seat management waste reduction (qualitative)	Plastic reduction via ReLIFE (qualitative)	Non-B3 only; Rp3.6M env. cost; plastic reduction
ISO 14001	Certified (valid to 2026)	Not disclosed	Not disclosed	Not disclosed
Green Programs	Green Freight; biodiesel; solar panels; digitalization	Green Commuter 5 pillars; 5 green stations; bike parking	ReLIFE (Green Hydration, EcoMeter, tree planting)	Plastic reduction; paper cups; eco-materials; tree planting
Digital / Paperless	Go-green document	C-Access; KMT mobile;	EcoMeter carbon	Not specifically disclosed
	digitalization	Palm Vein gate	tracking app	
Environmental Awards	Best CSR Logistic 2024; TOP CSR #Star 4	Gold Social Pillar; Silver Environmental Pillar	Not disclosed in AR	Not disclosed in AR
TJSL Fund	Rp1.12 billion	Not quantified	Not quantified	Rp70 million

The comparative mapping reveals several salient patterns. First, a pronounced disclosure gradient exists between the subsidiaries, with KAI Logistik occupying the most advanced position in terms of quantitative depth, GRI alignment, and third-party certification, followed by KAI Wisata with emerging but meaningful quantitative disclosure capability. KAI Commuter and KAI Bandara rely predominantly on qualitative and programmatic disclosures.

Second, the disclosure strategies exhibit a clear bifurcation between *operational-technical* approaches (KAI Logistik and KAI Wisata) and *narrative-experiential* approaches (KAI Bandara and KAI Commuter). This bifurcation does not align neatly with the initial hypothesis that transportation subsidiaries would uniformly produce more technically detailed disclosures than the tourism subsidiary. Rather, disclosure sophistication appears driven more by *organizational maturity in sustainability governance* than by sectoral classification alone.

Third, digital innovation emerges as a cross-cutting theme with distinct manifestations: KAI Logistik frames it as an operational efficiency tool; KAI Commuter deploys digital ticketing with incidental environmental benefits; KAI Bandara's EcoMeter is the most explicitly environmentally branded digital innovation; while KAI Wisata does not report specific digital environmental initiatives.

4.2. Discussion

4.2.1 Legitimacy Theory Interpretation: Differentiated Strategies for Stakeholder Acceptance

The findings, interpreted through Legitimacy Theory [9], [11], [10], reveal differentiated legitimacy management strategies across the PT KAI subsidiary ecosystem. Each subsidiary's environmental disclosure portfolio represents a strategically calibrated response to its specific legitimacy environment.

4.2.1.1 Transportation Subsidiaries: Compliance-Driven Pragmatic and Moral Legitimacy

KAI Logistik's comprehensive disclosure framework exemplifies what Suchman [9] terms the pursuit of *pragmatic legitimacy* through demonstrable alignment with stakeholder expectations. As a freight logistics operator handling B3 hazardous waste, KAI

Logistik faces direct regulatory scrutiny from KLHK and the Ministry of Transportation. Its disclosures are structured to furnish regulators with specific, verifiable data required to confirm compliance, thereby securing continued operational authorization. The explicit inclusion of PROPER rating targets confirms that KAI Logistik's disclosure strategy is oriented toward satisfying institutional gatekeepers.

Simultaneously, KAI Logistik's Green Freight Logistics program—with the potential to reduce 300 million tons of CO_2 emissions by 2050—constitutes a bid for *moral legitimacy*, predicated on whether the organization is "doing the right thing" [9]. By framing rail freight as an inherently greener alternative to road transportation, KAI Logistik constructs a moral narrative aligning its commercial interests with broader societal decarbonization goals.

KAI Commuter's disclosure approach illustrates a different strategy centered on *infrastructure-based cognitive legitimacy*. The Green Commuter strategy—with its emphasis on green stations, solar cells, and bicycle parking—aims to embed environmental awareness into the physical commuter experience, rendering green practices as a taken-for-granted feature of the brand. This aligns with Suchman's [9] characterization of cognitive legitimacy as the most durable form. However, the absence of quantitative data represents a significant vulnerability: without measurable benchmarks, KAI Commuter's green claims are susceptible to the charge of symbolic rather than substantive disclosure [12].

4.2.1.2. Tourism/Service Subsidiaries: Brand-Oriented Cognitive and Affective Legitimacy

KAI Bandara's ReLIFE initiative represents the most strategically innovative disclosure strategy observed. The deployment of EcoMeter, experiential branding, and participatory environmental actions constitutes an effort to construct *affective legitimacy*—a variant in which acceptance is achieved through the cultivation of emotional resonance and personal identification with the organization's environmental mission. Passengers are enrolled as active participants through gamified carbon tracking and leaderboard incentives.

From a Signaling Theory perspective [15], [16], KAI Bandara's strategy is conceptually rich but empirically thin. In Clarkson et al.'s [19] typology, such disclosures would be classified as "soft" rather than "hard"—rhetorical and aspirational rather than verifiable. This does not necessarily imply greenwashing, but indicates that KAI Bandara's communication prioritizes narrative plausibility and consumer engagement over empirical accountability.

KAI Wisata's disclosure profile presents a counterpoint that complicates the initial hypothesis. Despite being a tourism entity expected to produce qualitative disclosures, KAI Wisata provides more granular quantitative data than KAI Commuter or KAI Bandara. This suggests that disclosure quality transcends simple sectoral classification. KAI Wisata's reporting capability appears attributable to its GRI Standards-aligned Integrated Annual Report—with explicit reference to GRI 302, 303, 305, and 306 indicators—which functions as an independent driver of disclosure specificity, irrespective of operational scale.

4.2.2. Green Legitimacy Strategies: Mass Transportation versus Experience-Based Tourism

Table 5 synthesizes the disclosure strategy typology emerging from the comparative analysis.

Table 5. *Typology of Green Legitimacy Strategies across Subsidiary Sectors*

Dimension	Transportation Subsidiaries	Tourism Subsidiary	Legitimacy Type
Disclosure Mode	Quantitative-technical (emissions, intensity, certifications)	Qualitative-narrative (eco-tourism, green campaigns)	Pragmatic & Moral vs. Cognitive & Affective
Primary Audience	Regulators, parent company, industry peers	Consumers, tourists, general public	Compliance-driven vs. Market-driven
Disclosure Trigger	Material impact; regulatory mandate; ISO	Brand positioning; experiential differentiation	Reactive maintenance vs. Proactive construction
Substantive vs. Symbolic	Predominantly substantive (verifiable metrics)	Predominantly symbolic (narrative framing)	High signal credibility vs. Low signal cost
GRI Alignment	Strong (GRI 305, 302, 306)	Weak to moderate	Standards-based vs. Principles-based

Transportation subsidiaries deploy a *compliance-accountability model* of environmental disclosure, consistent with O'Donovan's [10] legitimacy *maintenance* strategies, where organizations sustain their social license through ongoing evidence of alignment with societal expectations. Tourism/service subsidiaries deploy a *narrative-engagement model*, aligned with Suchman's [9] *cognitive legitimacy construction*, where the goal is to render the organization's environmental orientation as a natural attribute of its identity.

The most significant finding is that KAI Wisata occupies a *hybrid position* between these models. This hybridity suggests that disclosure strategy is not deterministically fixed by sectoral affiliation but is mediated by organizational choices regarding reporting standards adoption. The implication is that the transition

from symbolic to substantive disclosure is achievable even for service-oriented subsidiaries, provided appropriate institutional frameworks are adopted.

4.2.3. Implications for the Group-Level Sustainability Image of PT KAI

The observed intra-group heterogeneity carries significant implications for PT KAI's overall sustainability image. The present analysis reveals fundamentally uneven building blocks: KAI Logistik provides comprehensive, auditable data; KAI Wisata provides emerging quantitative disclosures; while KAI Commuter and KAI Bandara contribute primarily qualitative narratives with limited empirical grounding. This unevenness introduces the risk of *"consolidated greenwashing"* [36]—where a parent company's aggregate narrative masks significant disparities at the subsidiary level. If PT KAI's consolidated report draws disproportionately on KAI Logistik's data while underrepresenting the disclosure gaps of other subsidiaries, the group-level narrative may present a misleadingly favorable impression.

From a policy perspective, PT KAI's holding-level sustainability strategy would benefit from *standardized disclosure protocols* across all subsidiaries. The GRI Standards framework—which KAI Wisata demonstrates can be adopted even by small service-oriented entities—provides a template for such standardization. Furthermore, the combination of KAI Logistik's technical disclosure depth with KAI Bandara's narrative innovation—a "substantive storytelling" approach—could produce an integrated disclosure model satisfying both institutional stakeholders' informational needs and consumer audiences' engagement expectations. Such integration would represent a mature realization of "strategizing green legitimacy": the deliberate, differentiated, yet coherent deployment of environmental disclosure as a strategic instrument for securing multi-stakeholder acceptance across a diversified holding group.

5. CONCLUSIONS

This study set out to investigate and compare the environmental disclosure strategies adopted by transportation and tourism subsidiaries within the PT Kereta Api Indonesia (Persero) holding group, employing Legitimacy Theory and Signaling Theory as its dual analytical lenses and content analysis of the 2024 Annual Reports of KAI Logistik, KAI Commuter, KAI Bandara, and KAI Wisata as its methodological instrument. The findings demonstrate that environmental disclosure within the PT KAI ecosystem is neither monolithic nor uniformly determined by sectoral classification; rather, it constitutes a differentiated, strategically calibrated practice shaped by the interplay of regulatory exposure, stakeholder composition, organizational maturity in sustainability governance, and the deliberate adoption of international reporting frameworks. KAI Logistik emerged as the most advanced discloser, providing quantitative emissions data across all three GHG scopes, holding ISO 14001:2015 certification, reporting a carbon intensity of 0.02 tonnes CO2eq per ton of goods transported, and explicitly targeting PROPER ratings within its sustainability roadmap—a disclosure architecture consistent with the pursuit of pragmatic and moral legitimacy through compliance-driven, substantive reporting. KAI Commuter, despite operating the largest passenger volume in the group through its electrified Commuter Line network, presented a predominantly infrastructure-oriented disclosure strategy under its Green Commuter pillar—encompassing green stations, solar cell plans, and bicycle parking—but without quantitative emissions, energy, or waste metrics, thereby exhibiting a cognitive legitimacy approach that prioritizes the naturalization of green practices over measurable accountability.

KAI Bandara distinguished itself through the ReLIFE initiative, an innovative consumer-facing program incorporating the EcoMeter carbon-tracking application, Green Hydration dispensers, and participatory tree planting movements, which collectively represent a bid for affective legitimacy through narrative engagement and experiential branding; however, the complete absence of quantitative environmental data renders this strategy analytically classifiable as symbolic rather than substantive disclosure. Perhaps the most theoretically significant finding concerns KAI Wisata, which—contrary to the initial hypothesis that tourism subsidiaries would produce predominantly qualitative disclosures—delivered GRI-aligned quantitative data on electricity consumption (150,514 kWh), fuel usage (7,800 liters), water consumption (2,030 m^3), and disaggregated GHG emissions (Scope 1: 18,486.47 kg CO2e; Scope 2: 140,580.07 kg CO2e), thereby demonstrating that the transition from symbolic to substantive environmental disclosure is achievable even for small, service-oriented entities when appropriate institutional frameworks—specifically, the structured adoption of GRI Standards within an Integrated Annual Report format—are deliberately embraced.

These collective findings contribute to the sustainability accounting literature in three ways: first, by introducing the concept of intra-holding disclosure heterogeneity as a meaningful analytical category that reveals how subsidiaries within a single corporate group adopt fundamentally different legitimacy strategies in response to their operational contexts; second, by extending the application of Legitimacy Theory and Signaling Theory to the underexplored domain of BUMN holding structures in an emerging economy, demonstrating that the substantive–symbolic disclosure spectrum operates not only across industries but within the organizational architecture of a single state-owned enterprise; and third, by challenging the deterministic assumption that sectoral classification predicts disclosure quality, as evidenced by the tourism subsidiary's superior quantitative disclosure relative to two larger transportation entities. The practical implications of this study are equally salient: PT KAI's holding-level

sustainability governance would benefit substantially from the implementation of standardized, GRI-aligned disclosure protocols across all subsidiaries—a measure that would mitigate the risk of consolidated greenwashing, enhance the credibility of the group's environmental narrative before regulators, investors, and the public, and ensure that the commendable practices already demonstrated by individual subsidiaries are systematically elevated into a coherent, verifiable, and strategically compelling group-wide sustainability story. The study acknowledges its limitations, including its reliance on publicly available documents that may not capture internal environmental management practices, the single-year observation window of 2024, and the inherent constraints of content analysis in verifying the accuracy of disclosed information, and accordingly recommends that future research extend this comparative framework through longitudinal designs, multi-method approaches incorporating interviews with sustainability managers, and cross-holding comparisons involving other BUMN groups to further illuminate the organizational dynamics of green legitimacy construction in developing-country contexts.

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