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Research Article

Developing Sustainability Disclosure Indicators Based on IFRS S1 & S2: Are We Ready?

Verawaty [1], Khomsiyah [2], Juniati Gunawan* [3], Muhammad Nuryatno[4]
[1,2,3,4]*Universitas Trisakti, Indonesia*
* juniatigunawan@trisakti.ac.id

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ABSTRACT

Introduction: Sustainability issues have gained global attention, driving the need for standardized and comparable sustainability reporting across countries. The IFRS Sustainability Standards—particularly IFRS S1 and IFRS S2—introduce a unified framework for disclosing sustainability matters as well as climate-related risks and opportunities. In Indonesia, current sustainability disclosures still follow POJK 51/2017, indicating a significant gap with the IFRS standards in terms of structure and scope.

Objectives: This study aims to (1) develop sustainability disclosure indicators based on IFRS S1 and IFRS S2, and (2) assess the readiness of Indonesian companies, the Indonesian Institute of Accountants (IAI), public accountants, and academics in adopting these standards.

Methods: Using a qualitative approach, this study combines document analysis and semi-structured interviews. The development of indicators was carried out in two stages: first, mapping the content of IFRS S1 and IFRS S2 using additional references (SASB, TCFD, CDSB, and corporate reports); and second, conducting thematic analysis of the interviews to identify financial impacts, risks, and opportunities. The quality of disclosure was evaluated using information quality theory (relevance, accuracy, completeness, timeliness, understandability, consistency, and reliability). Triangulation of indicator development was conducted using information quality theory, while triangulation for assessing the readiness of companies, IAI, academics, and public accountants was based on organizational change theory.

Results: This study proposes relevant sustainability disclosure indicators classified by accounting categories and transaction types, including practical examples. These indicators facilitate the mapping of sustainability issues to their financial impacts and align them with PSAK standards. The level of readiness among stakeholders varies, categorized as: (1) early-stage readiness, (2) moderately ready, and (3) ready for adoption.

Conclusions: This research contributes practical guidance for structured sustainability disclosures aligned with IFRS S1 and S2. It highlights implementation opportunities and challenges, and offers strategic insight for technical adoption. Limitations include access to quantitative accounting data and reliance on interviews, suggesting the need for deeper corporate data analysis in future research.

Keywords: IFRS S1, IFRS S2, Sustainability Disclosure, Adoption Readiness, Financial Indicators, Thematic Analysis.

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INTRODUCTION

Sustainability issues have become a global concern, prompting the need for a standardized and comparable sustainability reporting framework across countries. The International Financial Reporting Standards (IFRS) Sustainability Standards—namely IFRS S1, which addresses general disclosures on sustainability-related risks and opportunities, and IFRS S2, which specifically focuses on climate-related risks and opportunities—have emerged as the new global benchmark for corporate sustainability reporting. These standards carry significant implications for financial reporting, as they require entities to integrate sustainability considerations with financially material information.

In Indonesia, sustainability reporting is currently regulated under the Financial Services Authority Regulation (POJK) No. 51/POJK.03/2017. While this regulation has encouraged companies to prepare sustainability reports, there remains a considerable gap in structure and scope when compared with IFRS S1 and S2. Gunawan et al. (2022) emphasize the importance of strengthening governance, strategy, risk management, metrics, and targets in sustainability disclosures, in alignment with the requirements of IFRS S1 and S2. These elements are critical to bridging the gap between national reporting practices and international standards.

Previous studies (e.g., Amelia et al., 2024) have identified major challenges in implementing IFRS S1 and S2 in Indonesia, including resource constraints, the local regulatory environment, and institutional readiness. Conversely, Zghidi et al. (2023) found that the relationship between sustainability and financial performance is non-linear and highly dependent on specific industry contexts. Therefore, effective sustainability reporting must account for sector-specific characteristics and adopt optimal ESG strategies.

Sector-based standardization, as introduced by the Sustainability Accounting Standards Board (SASB) (Herz & Rogers, 2016), also serves as a critical foundation for developing sustainability disclosures. Furthermore, national regulatory developments—such as Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector (P2SK)—together with initiatives by the Indonesian Institute of Accountants (IAI) through the establishment of the Sustainability Standards Board, reflect growing momentum for adopting IFRS Sustainability Standards in Indonesia.

Through educational efforts, gap analysis, governance enhancement, and assurance mechanisms, the adoption of IFRS S1 and S2 is expected to improve the quality of sustainability reporting in Indonesia. This aligns with the perspective of PIM (2025), which asserts that the adoption of IFRS Sustainability Standards in Indonesia must be supported by a collaborative approach and capacity building among stakeholders to enhance transparency and support more responsible investment decision-making.

Based on this background, the objectives of this study are to:

1. Develop sustainability disclosure indicators aligned with IFRS S1 and IFRS S2;

2. Assess the readiness of companies, the Indonesian Institute of Accountants (IAI), public accountants, and academics to adopt IFRS S1 and IFRS S2 as sustainability reporting standards in Indonesia.

OBJECTIVES

This research design adopts information quality theory as the foundation for developing sustainability disclosures based on IFRS S1 and IFRS S2, and applies organizational change theory as the framework for assessing the readiness of (1) companies, (2) the Indonesian Institute of Accountants (IAI), (3) academics, and (4) public accountants in adopting IFRS S1 and IFRS S2. Information quality theory comprises seven key dimensions: (1) relevance, (2) accuracy, (3) completeness, (4) timeliness, (5) understandability, (6) consistency, and (7) reliability. These dimensions are essential to ensuring that sustainability disclosures provide useful information for stakeholders' decision-making. Organizational change theory encompasses three fundamental stages:

(1) Unfreezing, in which organizations recognize the need for change and begin to open up to transformation;

(2) Changing, which involves the actual implementation of change through adjustments to

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strategies, policies, systems, and behaviors; and

(3) Refreezing, where the implemented changes are institutionalized and become an integral part of the organization's culture and practices.

The adoption of IFRS S1 and S2 requires organizations to incorporate sustainability-related risks and opportunities into their financial reporting processes. Grounded in information quality theory and organizational change theory, this study explores two main dimensions: (1) the development of disclosure indicators aligned with IFRS S1 and S2, and (2) stakeholder readiness to adopt these standards. According to information quality theory (Wang & Strong, 1996), the relevance, accuracy, completeness, timeliness, understandability, consistency, and reliability of sustainability disclosures are critical to enhancing stakeholder trust and decision usefulness. Therefore, aligning disclosure practices with IFRS S1 and S2 is expected to improve the overall quality of sustainability reporting. Developing sustainability disclosure indicators based on IFRS S1 and S2 will enhance the quality and structure of sustainability reporting among Indonesian companies.

From the perspective of organizational change theory (Lewin, 1947), institutional readiness is a function of unfreezing (awareness), changing (implementation), and refreezing (institutionalization). Stakeholders such as companies, professional bodies, public accountants, and academics must undergo these stages to achieve full adoption. Previous studies (Amelia et al., 2024; Gunawan et al., 2022) have shown varying levels of readiness due to differences in awareness, resources, and institutional support. Significant variations exist in readiness levels among companies, professional accounting bodies (e.g., IAI), public accountants, and academics in adopting IFRS S1 and S2.

Moreover, the relationship between sustainability disclosure and financial performance is often non-linear and moderated by industry-specific factors (Zghidi et al., 2023). Therefore, sectoral adaptation and context-sensitive implementation are also critical in determining the success of IFRS-based sustainability reporting. Collectively, these theoretical perspectives provide a conceptual framework for analyzing both the technical feasibility of IFRS S1 and S2 implementation and the institutional dynamics influencing stakeholder readiness within the Indonesian context.

METHODS

Design and Procedures

This research design adopts information quality theory as the conceptual foundation for developing sustainability disclosures based on IFRS S1 and IFRS S2, and applies organizational change theory to assess the readiness of four key stakeholder groups: (1) companies, (2) the Indonesian Institute of Accountants (IAI), (3) academics, and (4) public accountants in adopting IFRS S1 and IFRS S2.

Information quality theory comprises seven core dimensions: (1) relevance, (2) accuracy, (3) completeness, (4) timeliness, (5) understandability, (6) consistency, and (7) reliability—all of which contribute to the effectiveness and credibility of sustainability disclosures.

Organizational change theory consists of three stages:

(1) Unfreezing, in which an organization recognizes the need for change and begins to open itself to transformation;

(2) Changing, which involves implementing changes through adjustments in strategies, policies, systems, and behaviors; and

(3) Refreezing, the stage where new changes are embedded into the organization's culture and sustained practices.

Conceptual Definitions and Variable Measurement

1. IFRS S1

IFRS S1 (General Requirements for Disclosure of Sustainability-related Financial Information) is a standard issued by the International Sustainability Standards Board (ISSB) that provides general guidance on disclosing

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sustainability-related financial information. Its objective is to meet the information needs of primary users of general purpose financial reports—such as investors, creditors, and lenders—by enabling them to assess sustainability-related risks and opportunities that could affect an entity's prospects, including cash flows, access to financing, and cost of capital over the short, medium, and long term. IFRS S1 sets out disclosure principles that involve identifying sustainability-related risks and opportunities, ensuring connectivity with general purpose financial statements, and presenting information that is relevant, appropriate, verifiable, comparable, and understandable. The standard also requires entities to apply IFRS S2 concurrently, particularly for climate-related issues, while considering sector-specific guidance such as the SASB Standards for context-appropriate disclosures.

The Governance, Strategy, Risk Management, Metrics, and Targets disclosure requirements under IFRS S1 obligate entities to disclose governance processes, controls, and procedures used to monitor and manage sustainability-related risks and opportunities. The Strategy disclosure requirements require entities to explain how sustainability-related risks and opportunities affect their business strategy. This includes identifying material sustainability-related risks and opportunities; disclosing actual and anticipated impacts on the business model and value chain; implications for strategy and decision-making, financial position, financial performance, and cash flows over different time horizons; and the resilience of the entity's strategy to such risks. IFRS S1 also permits reference to additional guidance for disclosing material sustainability information, including industry-specific or issue-specific metrics relevant to identified risks and opportunities.

Risk Management in IFRS S1 refers to the systematic processes used by entities to identify, assess, prioritize, and monitor sustainability-related risks and opportunities. This includes disclosing policies, inputs, parameters, scenario analyses, risk prioritization, and integration with the entity's overall risk management framework. Metrics under IFRS S1 are quantitative measures used to disclose sustainability information, which may include historical data, estimates, or forward-looking projections that could affect the entity's financial prospects. Metrics must be presented consistently; if changes occur, the entity must explain the revisions, provide comparative figures, and state the reasons, unless impracticable. Targets are quantitative or qualitative goals set by the entity to track progress toward strategic objectives or regulatory requirements. Disclosures should include relevant metrics, target timeframes, baselines, interim milestones, progress, reasons for changes (if any), and ensure that such information is consistent, clear, and meaningful.

2. IFRS S2

IFRS S2 is a sustainability disclosure standard that specifically focuses on communicating climate-related risks and opportunities that may affect an entity's financial prospects. The standard complements IFRS S1 and requires disclosures on climate governance, climate-related strategies, transition plans, metrics, and targets. IFRS S2 addresses both **physical risks** (e.g., natural disasters, extreme weather events) and **transition risks** (e.g., regulatory changes, technological shifts), as well as climate-related opportunities.

Disclosures under IFRS S2 should include information on climate-related risks and opportunities within the governance structure, climate risk and opportunity strategy, business model and value chain strategy, decision-making strategy, financial position–financial performance–cash flow strategy, climate resilience strategy, risk management, metrics and targets, and climate scenario analysis. The standard also references industry-based guidance from the **SASB Standards**, adapted for global application. IFRS S2 is applied concurrently with IFRS S1 when climate-related matters have a material impact on an entity's financial prospects.

3. Sustainability Reporting

In the Indonesian context, a **sustainability report** is a formal document prepared and presented by a company to transparently and accountably disclose its economic, social, and environmental performance to stakeholders. Regulated under the **Financial Services Authority Regulation No. 51/POJK.03/2017**, such reporting is mandatory for companies—particularly financial institutions, publicly listed companies, and public entities. The sustainability report serves to communicate the company's contribution to sustainable development and its commitment to good governance, ethics, and long-term business responsibility.

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Variable Measurement

I. Indicator Development Process

The development of sustainability disclosure indicators based on IFRS S1 and S2 follows a two-stage process:

1. **Stage 1: Quality-Driven Indicator Development**

Focused on producing high-quality disclosures aligned with the dimensions of information quality theory (relevance, accuracy, completeness, timeliness, understandability, consistency, and reliability).

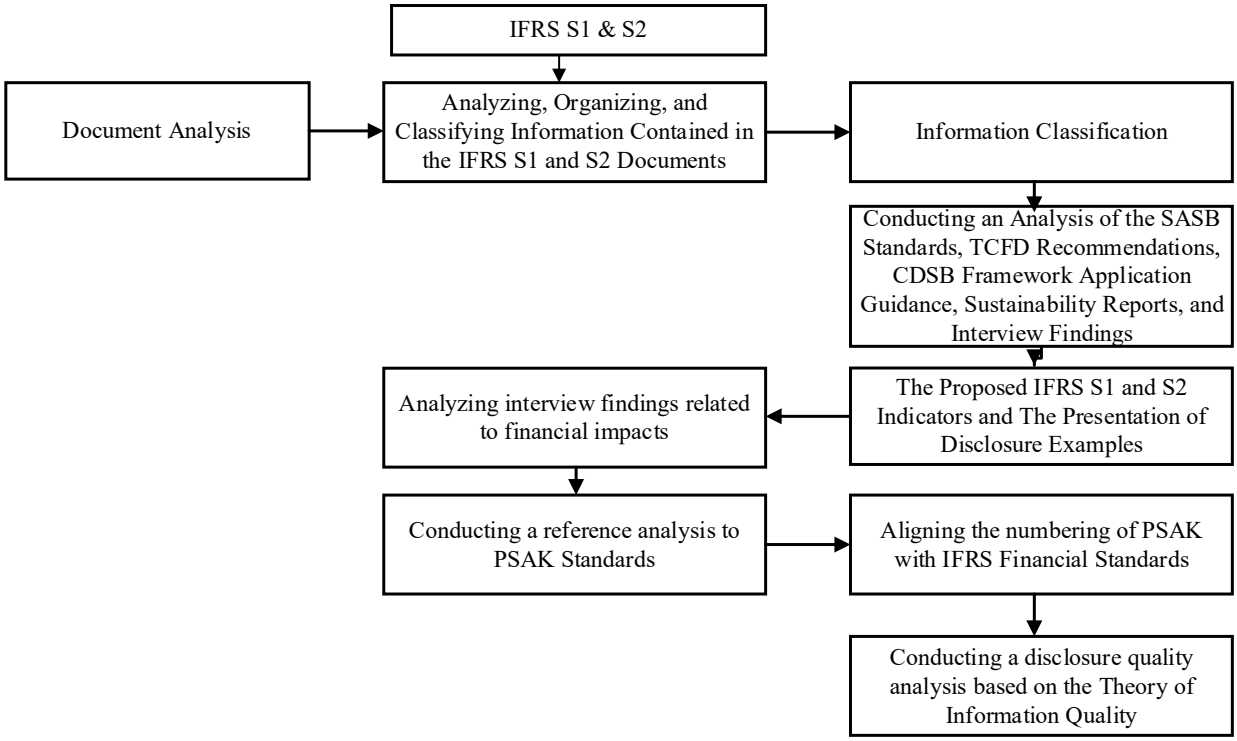

Figure 1: *Stage 1: Quality-Driven Indicator Development*

Stage 2: The Indicator Development Process: Identification of Risk and Opportunity

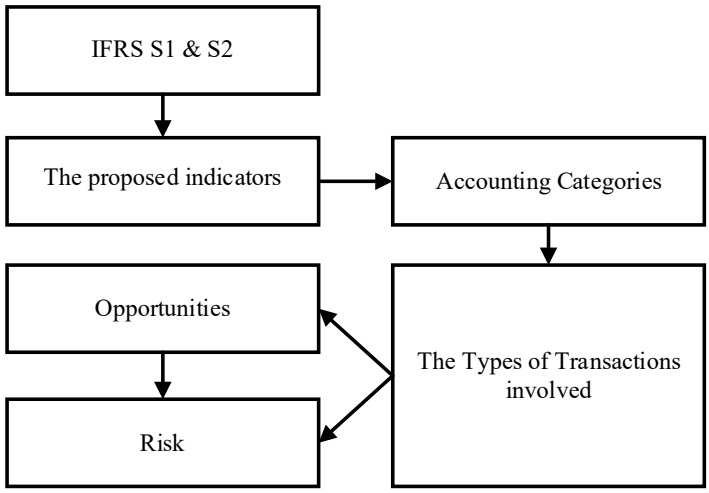

Figure 2: *Stage 2: The Indicator Development Process: Identification of Risk and Opportunity*

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I. **Readiness Assessment Process for Companies, The Indonesian Institute of Accountant (IAI), Academics and Public Accountants**

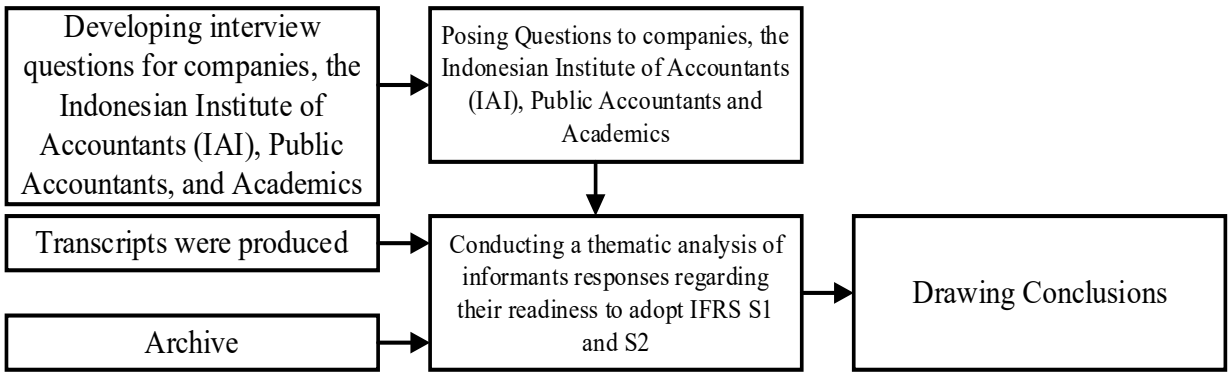

Figure 3: *Readiness assessment process for companies, the Indonesian Institute of Accountant (IAI), academics, and Public Accountants*

Sampling and Data Collection Methods

The sampling technique used in this study is non-purposive sampling, a method of sample selection that does not rely on specific targeted criteria or objectives. Respondents are selected randomly or based on availability, without considering particular characteristics of the population (Sugiyono, 2017). This method was chosen due to the accessibility of data sources and respondents, as well as because this study does not impose strict requirements such as age, position, or industry. As an exploratory study, it does not require rigorous population screening (Sekaran & Bogie, 2019).

The data collection method employed in this study is the interview, which involves directly asking respondents questions to obtain in-depth information related to the research topic. Interviews allow the researcher to gather qualitative and exploratory data, and to better understand individuals' perspectives, perceptions, and experiences (Sugiyono, 2017; Creswell, 2016).

Informant Criteria

Informants were selected based on their practical experience, strategic roles, and academic or professional relevance to sustainability reporting and the implementation of IFRS S1 and S2. These criteria were intended to ensure that data obtained from the interviews would be in-depth, valid, and aligned with the research objectives.

1.Companies

Position/role: Managers or personnel from ESG, finance, sustainability, or risk management divisions, with the following criteria:

a. Direct involvement in the preparation of sustainability reports or annual reports

b. Companies that publish annual reports

c. Companies that have considered or are in the process of adopting IFRS S1/S2 or OJK Regulation No. 51/2017

2.Academics

Area of expertise: Sustainability reporting, financial reporting, financial accounting, accounting information systems, or corporate governance, with the following criteria:

a. Actively teaching or conducting research on sustainability reporting, IFRS, or risk management

b. Having publications or active involvement in relevant academic forums

c. Knowledge of developments in global sustainability reporting standards (e.g., ISSB, IFRS Foundation)

3.Indonesian Institute of Accountants (IAI)

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While informants indicated that their views were personal, they held positions such as members of the Sustainability Standards Board, IAI management, sustainability standards staff, or technical experts involved in standard-setting. Their criteria included:

a. Participation in the development, adoption, or dissemination of accounting or sustainability reporting standards

b. Awareness of the transition process toward IFRS S1 and S2

c. Professional and academic background in accounting or sustainability reporting

4.Public Accountants

Position/role: Senior auditors, audit partners, or sustainability assurance specialists, with the following criteria:

a. Experience in auditing financial statements and/or sustainability reports

b. Involvement in developing assurance methodologies for non-financial information

c. Understanding of the challenges and opportunities of assurance related to sustainability and climate risk

Data were collected through online interviews (via Zoom) and written questions provided to the informants.

RESULTS AND DISCUSSIONS

This study employs a qualitative data analysis approach integrating documentary analysis with thematic interpretation of interview findings. The analysis was structured in two main stages, following the IFRS S1 and S2 indicator development framework.

1. Development of Sustainability Disclosure Indicators (IFRS S2 – Step 1 & 2)

In the first stage, a systematic content analysis was conducted on the IFRS S1 and S2 frameworks. Disclosure requirements were mapped based on specific paragraphs in the standards and translated into measurable indicators. These indicators were classified according to their relevance to governance, strategy, risk management, and metrics & targets for sustainability (IFRS S1), as well as governance, strategy, risk management, and metrics & targets for climate-related issues (IFRS S2). They were subsequently linked to financial reporting impacts (e.g., PSAK references: 201 – Presentation of Financial Statements, 110 – Consolidated Financial Statements, 114 – PSAK 219 – Defined Benefit Asset Ceiling, 117 – Insurance Contracts, 237 – Provisions, Contingent Liabilities, and Contingent Assets, 219 – Employee Benefits, 107 – Financial Instruments: Disclosures, 236 – Impairment of Assets, 207 – Statement of Cash Flows, 216 – Property, Plant, and Equipment, 224 – Related Party Disclosures, 208 – Accounting Policies, Changes in Estimates, and Errors, 113 – Fair Value Measurement, 238 – Intangible Assets, 202 – Inventories, 108 – Operating Segments, 121 – Levies, 210 – Events After the Reporting Period, 221 – Effects of Changes in Foreign Exchange Rates, 116 – Leases, 105 – Non-current Assets Held for Sale and Discontinued Operations, 109 – Financial Instruments, 212 – Income Taxes, 228 – Investments in Associates and Joint Ventures, 111 – Joint Arrangements, 112 – Disclosure of Interests in Other Entities) and renumbered in accordance with the IFRS-based structure. This localization ensures consistency between global and national sustainability disclosure practices.

The second stage focused on identifying sustainability-related risks and opportunities (IFRS S1) and climate-related risks and opportunities (IFRS S2).

2. Thematic Analysis of Stakeholder Interviews

Research questions were derived from the IFRS S1 and S2 frameworks. The analysis then identified forward-looking, estimative, and material plan disclosures that could have current financial impacts. A thematic analysis was performed on interview transcripts and written responses from four stakeholder groups: companies, the Indonesian Institute of Accountants (IAI), public accountants, and academics. Informants were selected based on their strategic roles, professional experience, and expertise in sustainability reporting. If an informant was able to address questions on forward-looking, estimative, and material plan disclosures that affect financial outcomes and could signal the related PSAK references, they were considered ready to implement sustainability reporting standards based on IFRS S1 and S2.

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The thematic coding revealed several readiness patterns for IFRS S1 and S2 adoption:

a. Initial Readiness – Marked by a basic understanding of the standards but limited structural or technical preparation. This was common among smaller companies or institutions with minimal exposure to international reporting frameworks.

b. Moderately Ready – Entities in this category had initiated internal discussions, conducted preliminary assessments, and demonstrated partial alignment with IFRS S1 and S2 disclosure principles (e.g., through compliance with POJK 51). However, integration with financial reporting systems remained limited.

c. Ready to Adopt – Institutions in this category, particularly those with established sustainability functions and access to professional training, exhibited both institutional and technical readiness for comprehensive IFRS S1 and S2 implementation.

Interview findings highlighted recurring themes, including the need for clear implementation guidelines, cross-sector capacity building, and harmonization between PSAK and IFRS S1 & S2 sustainability requirements. Informants also noted the absence of systems to capture forward-looking financial data and emphasized the importance of assurance mechanisms to enhance disclosure credibility.

3. Integration of Disclosure Indicators and Thematic Findings

The integration of documentary analysis and interviews underscores the feasibility of developing sustainability indicators aligned with IFRS S1 and S2 while identifying institutional readiness gaps. The proposed indicators are grounded not only in theory (based on IFRS S1 & S2) but also validated through practical insights from stakeholder interviews.

Furthermore, aligning disclosure content with information quality dimensions—relevance, accuracy, completeness, timeliness, understandability, consistency, and reliability—confirms that the proposed structure meets the qualitative expectations of both financial and non-financial information users.

Results

Table 1 The initial step focused on translating the disclosure requirements of IFRS S1 and S2 into measurable indicators. Each disclosure item was aligned with specific governance components and mapped to financial impacts and relevant PSAK references. Below is a summary of the proposed indicators:

Table 1 Proposed Indicators From IFRS S2 Step 1

Dimension	Disclosure Requirement	Proposed Indicator	Example	Financial Impact
Governance	The existence of climate risk monitoring systems	Climate risk monitoring system integrated into governance	Climate risk dashboard linked to ESG committee	Enhanced investor trust; potential funding opportunities
Governance	Identification of governance bodies overseeing climate risk	Assignment of responsible individuals	Appointment of Chief Sustainability Officer	Costs of governance structure enhancement
Governance	Clear role definition in risk oversight	Availability of official documentation (e.g., TOR, SOP)	Risk governance policy signed by BoD	Compliance audit and governance costs

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Dimension	Disclosure Requirement	Proposed Indicator	Example	Financial Impact
Governance	Competency and training of responsible governance bodies	Competency alignment and training implementation	Climate risk training for managers	HR development costs

2. Proposed Indicators from IFRS S2 Step 2

In the second step, the focus shifted to identifying financial implications of risks and opportunities related to climate issues. Indicators were classified by accounting categories and transaction types. Sample results are summarized below:

Table 2 Proposed Indicators from IFRS S2 Step 2

Dimension	Core Content	Proposed Indicator	Accounting Category	Type of Transaction	Opportunity	Risk
Governance	Governance process for climate policy implementation	Governance framework process	Operational Expense	Costs for policy development and implementation	Enhanced climate risk management capacity	Additional implementation costs
Governance	Role of Board Committees	Role of governance bodies	Operational Expense	Committee setup for climate governance	Stronger climate oversight structures	Increased administrative burden
Governance	SOP for roles and responsibilities	SOP for climate governance	Administrative Expense	Cost for SOP preparation and implementation	Clarity in responsibility and execution	Resistance to policy changes
Governance	Competency of board members in climate governance	Training and qualification metrics	HR Expense	Climate competency training for executives	Strengthened strategic oversight	Ongoing training costs

This study employs a two-stage qualitative analytical framework to develop sustainability disclosure indicators and assess stakeholder readiness to adopt IFRS S2 within the Indonesian context. Findings derived from the documentary analysis of IFRS S2 standards are integrated with insights from interview data and categorized into governance dimensions, financial impact mapping, and risk–opportunity analysis.

4.1 Stage 1 – Indicator Development Based on IFRS S2 Disclosure Requirements

The first stage of the analysis focused on extracting and transforming IFRS S2 disclosure requirements into operational indicators. Each paragraph of the standard was examined and interpreted into measurable indicators that could be contextually applied.

For instance, paragraph 5 of IFRS S2, which emphasizes **the objectives of climate-related financial disclosures**, was translated into an indicator referring to the **existence of an integrated climate risk monitoring system** within the organization's governance structure. This was further elaborated through practical examples—such as the use of **climate risk dashboards**—and its financial implications, including enhanced investor confidence and improved access to capital due to greater transparency. The indicator was mapped to **PSAK 201** on the presentation of financial statements to ensure alignment with local regulations.

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Similarly, paragraph 6(a), which requires the identification of governance roles responsible for sustainability risks, was translated into the proposed indicator of appointing a Chief Sustainability Officer (CSO) or an equivalent position. The associated financial impacts include increased administrative costs related to strengthening governance structures, mapped to PSAK 110 on internal control within entities.

Each indicator was assessed against the seven dimensions of information quality theory—relevance, accuracy, completeness, timeliness, understandability, consistency, and reliability. This evaluation was essential to determine whether the indicators could provide decision-useful information in the context of sustainability.

Table 3 IFRS S2 Step 1-Governance Dimension

Paragraph	Disclosure Requirement	Indicator	Example Implementation	Financial Impact	PSAK Mapping
5	Objective of climate-related financial disclosure	Availability of climate risk monitoring system	ESG dashboard, internal reporting tools	Investor trust; access to green finance	PSAK 201
6(a)	Identifying oversight body for climate risk	Role assignment: CSO or ESG Committee	Appointment of CSO with defined responsibilities	Structural reform costs, training budget	PSAK 110
6(a)(ii)	Competency of oversight bodies	Training and competency development programs	Climate risk workshops for board members	HRD & competency budget	PSAK 201 ISAK 114–PSAK 117)

4.2 Stage 2 – Mapping Risks, Opportunities, and Financial Effects

The second stage involves the contextualization of indicators through a financial lens, linking each disclosure item with accounting categories, transaction types, and an assessment of potential financial risks and opportunities. For example, the requirement to disclose governance procedures is classified under operational expenses, where the entity would incur costs associated with the formulation and implementation of policies. Conversely, this initiative also presents opportunities such as improved effectiveness in managing climate risks, enhanced strategic alignment, and increased corporate reputation. Furthermore, paragraph 6(a)(i), which involves the documentation of responsibilities (e.g., SOPs, manuals), is associated with administrative expenses, particularly those related to the drafting and implementation of policies. The identified risks include resistance to changes in internal policies, while the opportunities lie in establishing clearer governance roles and a more robust risk accountability framework.

Disclosures related to financial statements are typically informational in nature and are presented outside the audited financial statements. The prospective form of opinion for sustainability reports and its potential future effects remain an important subject for further consideration.

Triangulation Approach:

1.Triangulation of IFRS S2 Indicator Development using the seven dimensions of the Information Quality Theory.

2.Triangulation of the Readiness of Companies, IAI, Academics, and Public Accountants using Organizational Change Theory.

The readiness of companies, the Indonesian Institute of Accountants (IAI), academics, and public accountants to adopt IFRS S1 and S2 sustainability standards can be analyzed through the lens of Organizational Change Theory. First, in terms of awareness and acceptance, each stakeholder demonstrates varying degrees of understanding regarding the urgency and benefits of implementing these new standards. Companies and public accountants, for instance, increasingly recognize the importance of climate risk reporting in maintaining reputation and

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competitiveness, while academics and IAI actively engage in disseminating and deepening understanding of the standards. Second, from the perspective of capacity and resources, readiness is reflected in the availability of skilled professionals, technological infrastructure, and adequate training to support the change process. Companies are preparing reporting systems and climate risk dashboards, IAI provides guidelines and training for its members, while academics are developing curricula and conducting related research.Third, leadership and commitment play a pivotal role, with active support from leaders across the four groups serving as the primary driver of adaptation and implementation effortFourth, communication and participation are key factors, as open dialogue mechanisms among stakeholders facilitate information exchange and coordination. Finally, in terms of adaptation processes and mechanisms, each party demonstrates concrete steps to adjust systems and work procedures—from integrating climate risks into corporate risk management, updating standards by IAI, innovating academic research, to adapting audit practices by public accountants.Overall, readiness can be understood as the outcome of a dynamic interaction among these factors within the complex and ongoing context of organizational change. Developing Sustainability Disclosure Indicators:

1. Based on IFRS S1, integrated with SASB standards.

2. Based on IFRS S2, presented in a sequential and structured manner.

Paragraph Name

I. Proposed IFRS S2 Indicators

II. Disclosure Examples

III. Financial Impact: effect on the company's financial condition

IV. PSAK

V. Opportunities

VI. Risks

VII. Triangulation using Information Quality Theory

5. (I) Climate risk monitoring system within the corporate governance structure; (II) The company has a climate risk monitoring dashboard that is regularly reported to the board of commissioners; (III) Enhancing investor confidence; potential impact on the cost of capital; (IV) 201; (V) Opportunity: increasing investor confidence; (VI) Risk: implementation costs of the climate risk monitoring system; (VII) Triangulation: validation of the existence of the dashboard and regular reports (completeness and reliability), verification of timely reporting to the board of commissioners (timeliness), and stakeholder feedback on the relevance of the information.

6(a) (I) Appointment of a Chief Sustainability Officer responsible for monitoring and reporting climate risks; (II) Board of commissioners/individual; (III) Costs of strengthening governance structure and training; (IV) 110; (V) Opportunity: strengthening corporate sustainability leadership; (VI) Risk: increased structural and training costs; (VII) Triangulation: confirmation of formal appointment through official documents (completeness), evaluation of role effectiveness through performance reports (relevance and reliability), and regular reporting to ensure timeliness.

6(a)(i) (I) Availability of official documents: terms of reference, mandates, policies, or SOPs; (II) Climate risk policy document signed by the board of directors and applicable to all business units; (III) Budget allocation for governance compliance audits; (IV) 201, 110; (V) Opportunity: improving governance compliance and credibility; (VI) Risk: audit costs and preparation of official documents; (VII) Triangulation: audit of policy and mandate documents (accuracy and completeness), evaluation of internal audit reports (reliability), and scheduled updates of documents (timeliness).

6(a)(ii) (I) Suitability of competencies and training provided; (II) Climate risk management training for risk managers and board members at least once a year; (III) Training and HR development costs; (IV) ISAK 114, PSAK 117; (V) Opportunity: improved climate risk management competence; (VI) Risk: high training and HR development costs; (VII) Triangulation: training documentation and participant records (completeness), evaluation of training

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results (relevance and reliability), and regular training schedules (timeliness).

6(a)(iii) (I) Frequency of climate risk reports and evaluation meetings with the board of directors; (II) Climate risk evaluations conducted quarterly and reported in audit committee meetings; (III) Costs of preparing periodic reports and information systems; (IV) 201; (V) Opportunity: more effective climate risk monitoring; (VI) Risk: operational costs for regular reporting; (VII) Triangulation: verification of reporting schedules (timeliness), validation of report content against risk data (accuracy and relevance), and confirmation of report receipt by the board (reliability).

6(a)(iv) (I) Evidence of climate risk integration into policies, strategies, or strategic decision-making; (II) Climate risks considered in investment decisions and sustainable supply chain strategies; (III) Potential costs from poor strategic decisions when climate risks are ignored; (IV) 237; (V) Opportunity: more sustainable investment decision-making; (VI) Risk: financial losses if strategies fail; (VII) Triangulation: review of policy and strategy documents (completeness and consistency), management interviews on decision-making (relevance), and evaluation of historical financial impacts (accuracy and reliability).

6(a)(v) (I) Number and achievement of climate targets; linkage of climate metrics with management remuneration; (II) Management bonuses tied to a 10% carbon emissions reduction in one year; (III) Climate-based incentives may increase salary/bonus expenses; (IV) 219; (V) Opportunity: encouraging management performance in emission reduction; (VI) Risk: increased remuneration expenses; (VII) Triangulation: validation of climate target achievements through internal monitoring reports (accuracy), confirmation of remuneration linkage via HR policy documents (completeness and consistency), and timely evaluation of financial reports related to remuneration costs (timeliness and reliability).

6(b) (I) Climate-related management oversight structure; coordination and reporting flows; (II) Presence of a layered responsibility structure from line management to directors for climate issues; (III) High costs of developing internal reporting systems; (IV) 201, 110; (V) Opportunity: more structured climate risk coordination and oversight; (VI) Risk: high costs of reporting system development; (VII) Triangulation: cross-check of organizational structure documents and reporting flows (reliability), progress reports on reporting system development (timeliness), and management interviews regarding coordination effectiveness (clarity and relevance).

6(b)(i) (I) Existence of a dedicated climate committee and delegation of management roles; (II) Establishment of a Climate Committee under the Board of Directors with authority to set corporate climate policies; (III) Costs of establishing and operating the special committee; (IV) 201; (V) Opportunity: more focused climate policies; (VI) Risk: operational costs of the special committee; (VII) Triangulation: verification of committee establishment documents and mandates (accuracy and reliability), reports on committee activities and policy outcomes (completeness and consistency), and timely evaluation of operational budgets (timeliness).

6(b)(ii) (I) Existence of internal control systems related to climate risk and their integration; (II) Internal audit SOPs including checks on the effectiveness of climate risk mitigation in operational units; (III) Investments for internal control systems and audits; (IV) 201, 107; (V) Opportunity: improving climate risk control effectiveness; (VI) Risk: high initial investments for systems and audits; (VII) Triangulation: synchronization of internal audit SOP documents, audit results, and investment reports related to climate risk control (accuracy, reliability, completeness), and management interviews regarding implementation (clarity).

7. (I) Availability of integrated governance disclosure, without duplication, if already presented in other sustainability sections; (II) Climate risk governance is presented in the sustainability report and refers to the organizational structure and strategy sections; (III) Reporting efficiency that can reduce administrative and compliance costs; (IV) 201; (V) Opportunity: reporting efficiency and cost reduction; (VI) Risk: potential loss of information detail if overly summarized; (VII) Triangulation: validation of governance disclosure consistency between the sustainability report and the annual report (consistency), review of information detail and coverage (completeness and relevance), and review of the reporting process to ensure efficiency and timeliness.

Strategy

Climate-Related Risks and Opportunities Strategy

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10. (I) Number of identified climate-related risks and opportunities; (II) Flood risk to factory assets, market opportunities for low-carbon products; (III) Asset impairment, increased potential revenue from environmentally friendly products; (IV) 236, 23; (V) Opportunity: increased revenue from environmentally friendly products; (VI) Risk: asset impairment due to flooding; (VII) Triangulation: Using historical flood risk data and market reports on environmentally friendly products (accuracy, relevance), verifying asset valuations through independent audits (reliability), and ensuring information is updated regularly (timeliness) and consistent across reports.

10(a).(I) Number of identified physical and transition risks; Physical risk: flooding; (II) Transition risk: carbon emission regulations; (III) Risk of operational losses or additional compliance costs; (IV) 237, 201; (V) Opportunity: business adaptation to leverage low-carbon regulations; (VI) Risk: additional compliance costs due to regulation; (VII) Triangulation: Validating identification of physical and transition risks through weather data and regulatory documents (completeness, relevance), assessing compliance cost impacts from financial statements (reliability), and engaging in dialogue with regulators and operational units (understandability, consistency).

10(b). (I) Risk classification by time horizon: short, medium, long term; (II) Annual flooding (short term), 2030 renewable energy policy (medium term); (III) Impact on operational cash flows or changes in investment structure; (IV) 207, 216; (V) Opportunity: adjusting investments in line with renewable energy trends; (VI) Risk: cash flow disruption due to annual disasters; (VII) Triangulation: Synchronizing time horizon risk data with financial reports and investment plans (accuracy, consistency), using valid climate prediction models (reliability), and periodic updates from risk management (timeliness).

10(c). (I) Number of risks/opportunities by time horizon; (II) 2 short-term risks, 3 medium-term risks, 1 long-term risk;

(III) To be aligned with cash flow models and project feasibility assessments; (IV) 30, 336; (V) Opportunity: optimizing investment strategy based on time horizons; (VI) Risk: misallocation of capital if project feasibility assessments are inaccurate; (VII) Triangulation: Verifying risk/opportunity data through project reports and cash flow model evaluations (accuracy, reliability), reviewing project feasibility audit reports (completeness), and engaging in financial management communication (understandability, consistency).

10(d). (I) Definition of time horizons and integration into corporate strategy; (II) Short term: 1–2 years, medium term: 3–5 years, long term: >5 years; (III) Influence on investment, product development, and funding strategy; (IV) 201, 224; (V) Opportunity: more targeted strategic planning; (VI) Risk: funding strategy errors if time horizon assumptions are incorrect; (VII) Triangulation: Reviewing corporate strategy documents and investment projections (completeness, relevance), periodically evaluating time horizons against realized investment outcomes (accuracy, consistency), and engaging in dialogue with financial planning teams (understandability, reliability).

11. (I) Sources of data and projection models used in risk/opportunity identification; (II) Historical weather data, IPCC projections, IEA Net Zero scenario; (III) Avoiding underestimation/overestimation of assets/liabilities; (IV) 210, 208; (V) Opportunity: data-driven risk mitigation planning; (VI) Risk: biased or unrealistic projection results; (VII) Triangulation: Using multiple credible data sources and tested projection models (accuracy, reliability), cross-checking projection results with historical data and alternative scenarios (completeness, consistency), and regularly updating projections (timeliness).

12. (I) Number and types of risks/opportunities identified by industry sector; (II) Energy sector: stranded asset risk; food sector: crop failure risk; (III) May affect revenue recognition and fair value measurement; (IV) 113, 216, 238; (V) Opportunity: portfolio diversification to reduce dependence on high-risk sectors; (VI) Risk: revenue losses in climate-affected sectors; (VII) Triangulation: Validating sectoral risk classifications with industry data and market reports (relevance, completeness), auditing revenue recognition and fair value by independent auditors (accuracy, reliability), and reviewing portfolio strategies with risk management (understandability, consistency).

Strategy-Business Model and Value Chain

13. (I) Number and types of risks and opportunities affecting the business model and value chain; (II) Risk of raw material supply chain disruption due to extreme weather; (III) Opportunity for energy efficiency in distribution; decrease in production volume, increase in logistics costs, opportunity for operational cost efficiency; (IV) 201, 216,

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202; (V) Opportunity: operational cost efficiency through optimized energy use in distribution; (VI) Risk: increased logistics costs due to extreme weather; (VII) Triangulation: Ensuring relevance and completeness of supply chain disruption data through operational and distribution reports, verifying the accuracy of cost and efficiency impacts with financial statements, and ensuring consistency of data from both external and internal weather reports.

13(a).(I) Frequency and severity of supply chain disruptions and investments aimed at mitigating climate risks; (II) Impact of flooding on the distribution of goods or raw materials; (III) Adoption of low-carbon technology; additional costs due to operational disruptions or required mitigation investments; (IV) 237, 23, 236; (V) Opportunity: emission reduction through low-carbon technology; (VI) Risk: high investment costs for mitigation; (VII) Triangulation: Cross-checking supply chain disruption data with incident reports and operational audits (accuracy, reliability), validating low-carbon technology investments through financial documents and project reports (completeness), and obtaining feedback from distribution and production units (understandability, consistency).

13(b). (I) Proportion of revenue or assets exposed to climate risk in specific regions; (II) 40% of manufacturing assets are located in drought-prone areas; 60% of suppliers are located in coastal areas prone to flooding; (III) Increase in loss reserves, need for location diversification, potential insurance losses; (IV) 216, 408, 107; (V) Opportunity: diversifying operational locations to strengthen supply chain resilience; (VI) Risk: asset losses and increased insurance costs; (VII) Triangulation: Using geospatial data and regional risk reports (relevance, reliability), verifying financial statements related to loss reserves and insurance costs (accuracy, completeness), and evaluating location diversification strategies through management meetings and policy documentation (consistency, understandability).

Strategy and Decision Making

14. (I) the number and types of climate risks and opportunities identified in the strategy; (II) emission reduction strategies, supply chain redirection; (III) changes in production costs, potential losses or gains; (IV) 201, 30; (V) opportunities: efficiency of production costs through low-carbon strategies; risks: potential losses due to transition costs. (VII) triangulation: ensuring the relevance of the strategy to climate risk by evaluating the company's strategy documents, verifying the accuracy of cost impacts through financial statements, and ensuring information is delivered in a timely and consistent manner in management reports.

14 (a). (I) short-term and long-term emissions targets; mitigation roadmap; (II) net zero emissions plan by 2045; (III) investment in low-carbon technologies; (IV) 216, 237; (V) opportunity: positive reputation of achieving zero emissions targets; (VI) risk: high need for technology investment. (VII) triangulation: validation of targets and roadmaps through planning documents and progress reports, ensuring completeness of technology investment data and evaluation of program effectiveness, and verifying consistency of reporting to stakeholders.

14(a) (i). (I) Number of reinvestments or relocations; portfolio changes; (II) closure of carbon-intensive plants and switching to renewable energy; (III) impairment of assets, restructuring costs; (IV) 236, 216, 408; (V) opportunities: significant emission reductions; (VI) risks: asset value losses and high restructuring costs. (VII) triangulation: Crosscheck investment and relocation data with audit financial statements, validation of portfolio change reports, and evaluation of financial impacts that are reported regularly and consistently.

14(a) (ii). (I) the number of relocated facilities, low-emission equipment; (II) relocation of plants to areas safe from flooding, the use of high-efficiency machinery; (III) the cost of upgrading fixed assets, new depreciation; (IV) 216, 208; (V) opportunities: increased production efficiency; (VI) risks: the cost of upgrading assets and additional depreciation. (VII) triangulation: verifying relocation and asset replacement data with physical documentation and financial statements, ensuring that cost and depreciation information is recorded completely and accurately, and reporting on developments in a timely manner. (VII) triangulation: ensuring the reliability of partnership data through formal contracts, supplier audit reports, and training documentation, and ensuring the completeness and consistency of cost information in financial statements.

14(a) (iii). (I) Number of low-carbon supply chain partnerships; (II) cooperation with environmentally friendly raw material suppliers; (III) supplier training and audit costs; (IV) 224, 328; (V) opportunities: strengthening brand image through sustainable suppliers; (VI) risks: high training and audit costs. (VII) triangulation: ensuring the reliability of partnership data through formal contracts, supplier audit reports, and training documentation, and

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ensuring the completeness and consistency of cost information in financial statements.

14(a) (iv). (I) time Scheme and Transition scenario; (II) transition from coal to solar energy in 10 years; (III) long-term investment, accelerated depreciation of old assets; (IV) 30, 236; (V) opportunity: long-term emission reduction; (VI) risk: large depreciation expense of old assets. (VII) triangulation: evaluate time schemes and investment realizations through Project Management reports, synchronize asset depreciation data with audit financial statements, and ensure periodic reporting is consistent and timely.

14(a) (v). (I) emission intensity (CO_2/product unit); (II) climate budget; reducing emissions by 50% by 2030 through energy efficiency; reduction in long-term operating costs; (IV) 216, 237; (V) opportunity: long-term savings in operating costs; (VI) risk: high initial costs for energy efficiency improvements. (VII) triangulation: validate emission intensity measurements through environmental audits and production data, verify climate budgets with financial documents, and ensure cost and savings reporting information is consistent and timely.

14 (b). (I) Total annual budget for Climate Action; (II) allocation of funds for clean energy research and employee training; (III) operating costs increase in the short term, added value in the long term; (IV) 208, 216; (V) opportunities: product and process innovations from Clean Energy Research; (VI) risks: short-term increases in operating costs. (VII) triangulation: ensuring the completeness and relevance of the budget through financial planning documents, verifying the accuracy of cost realization and allocation of funds in financial statements, and ensuring that reporting of costs and benefits is carried out on time and consistently.

14 (c). (I) target achievement and deviation from the plan; (II) achievement of 80% of the previous year's emissions target; (III) Risk Evaluation and strategy correction; potential reduction of incentives; (IV) 201, 210; (V) opportunity: improvement of performance evaluation-based strategies; (VI) risk: loss of incentives if the target is not achieved. (VII) triangulation: validation of target achievement and deviation data with internal monitoring reports (accuracy and reliability), verification of strategy evaluation through management meeting documentation (completeness and consistency), and timely submission of reports to stakeholders (timeliness and comprehensibility).

Strategy-Financial Position, Financial Perfomance, and Cash Flow

15 (a) (I) financial position (Assets, Liabilities), performance (revenue, profit), operating cash flows; (II) damage to assets due to flooding; (III) impairment of fixed assets and disruption of cash flows; (IV) 216, 207; (V) opportunity: flood-resistant infrastructure improvements can increase long-term asset values; risk: disruption of cash flows due to asset damage. (VII) triangulation: verification of asset damage by physical inspection and insurance documentation (accuracy, reliability), crosscheck of financial statements and cash flows for financial impact (completeness), as well as regular reporting on schedule (timeliness, consistency).

15 (b) (I) projected profit and loss, EBITDA, capital expenditures; (II) investments in clean energy technologies; (III) changes in estimated future cash flows; (IV) 201, 210; (V) opportunities: energy cost savings from clean technologies; (VI) risks: uncertain return on investment. (VII) triangulation: synchronization of financial projection data with actual investment reports (accuracy), validation of projection assumptions with market and technological conditions (relevance), and periodic evaluation by internal and external auditors (reliability).

16 (a) (i) operating costs, Revenue, EBITDA; (II) increased costs due to temperature extremes; (III) eroded profit margins; (IV) 23, 207; (V) opportunity: more efficient product innovation; (VI) risk: margin pressures due to high costs. (VII) triangulation: verifying cost and revenue data through official financial statements (accuracy), adjusting information to temperature and operational trends (relevance), and reporting changes regularly (timeliness).

16 (b) (I) assets and liabilities subject to value adjustment; (II) impairment of land values in flooded areas; (III) impairment of fixed assets; (IV) 236, 216; (V) opportunity: diversification of asset locations; risk: rapid depreciation of assets in disaster-prone areas. (VII) triangulation: validation of asset value with independent assessment (reliability), site risk analysis with geospatial and weather data (relevance, completeness), and consistent and timely financial statements.

16 (c) (I) projected changes in balance sheet and profit and loss; (II) projected increase in asset protection costs; (III) increase in future expenses; (IV) 210, 201; (V) opportunities: increase in asset security; (VI) risks: significant

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protection cost expenses. (VII) triangulation: Crosscheck projected protection costs with budget and realization (accuracy), verify risk data with internal audit Reports (reliability), and periodically report according to accounting standards (timeliness). 16(c) (i) (I) capital expenditure climate/Opex, Green Investment; (II) solar panel investment, energy transition; (III) changes in the composition of fixed assets; (IV) 216, 201; (V) opportunities: long-term reduction in energy costs; (VI) risks: high initial capital requirements. (VII) triangulation: verifying investment documents and financial statements (accuracy), ensuring the completeness of green investment data (completeness), and ensuring timely and consistent reporting (timeliness, consistency).

16(c) (ii) (I) sources of funds (green loans, transition bonds); (II) issuance of green bonds; (III) changes in capital structure and interest charges; (IV) 208; (V) opportunities: access to low-cost financing; (VI) risks: market risks to green bonds. (VII) triangulation: validation of bond issuance data through official documents (reliability), market risk analysis of external and internal reports (relevance), and consistent and timely financial reporting (consistency, timeliness).

16 (d) (i) changes in climate revenues and costs; (II) revenues from zero-emission services; (III) increased profits or costs of climate adaptation; (IV) 23, 2017; (V) opportunities: opening of new markets based on zero emission solutions; (VI) risks: adaptation costs that weigh on cash flows. (VII) triangulation: ensuring the accuracy of revenues and expenses through documented financial statements, evaluating the relevance of nolnol service data to business strategy, and ensuring timely and consistent reporting to management and stakeholders.

17 (I) Range of losses or potential earnings; (II) projected losses of Rp 100-200 million from climate risk; (III) improved understanding of financial risk; (IV) 201; (V) opportunities: better risk management reduces long-term losses; (VI) risks: potential losses remain high. (VII) triangulation: verification of estimated losses by historical risk analysis (accuracy and reliability), checking consistency of projections with previous financial data, and ensuring periodic reporting (timeliness).

18 (A) (I) reasonable and documented Data; (II) historical data of weather, temperature trends, climate policy; (III) actual risk-based information; (IV) 210; (V) opportunities: more accurate data-based decision making; (VI) risks: limitations of historical data for future prediction. (VII) triangulation: ensuring the completeness and reliability of historical data through official sources, evaluating the relevance of data to current conditions, and ensuring data is updated regularly and reported transparently.

18 (b) (I) entity capability-based approach; (II) risk Model adapted to HR capacity; (III) relevant disclosures without wasting costs; (IV) 201, 208; (V) opportunity: efficiency of disclosure costs; (VI) risk: lack of depth of risk analysis. (VII) triangulation: validation of human resources competency through certification and training (reliability), ensuring disclosures according to capacity and risk relevance, and evaluating the consistency and completeness of disclosures over time.

19 (I) where impacts cannot be measured separately; (II) climate risk is subsumed into market risk; (III) not required to provide quantitative figures; (IV) 201; (V) opportunity: focus on more relevant aggregate risks; (VI) risk: missing details of specific risks. (VII) triangulation: assess the relevance and consistency of combining risk with financial data, ensure financial reporting remains complete and timely, and conduct audit reviews to reduce the risk of missing important details.

19 (A) (I) climate impacts cannot be identified; (II) there are no separate estimates for flooding; (III) quantitative information is irrelevant; (IV) 201, 210; (V) opportunity: measurement cost savings; (VI) risk: decision is not optimal due to lack of detailed data. (VII) triangulation: ensuring qualitative and descriptive data is comprehensive enough, evaluating the impact of decisions from data limitations, and ensuring reports are consistently delivered and understandable.

19 (b) (I) uncertainty is too high; (II) long-term climate change is difficult to measure; (III) information is useless if it is too speculative; (IV) 201, 210, 236; (V) opportunity: focus on definitive data; (VI) risk: missing out on early mitigation opportunities. (VII) triangulation: assess the reliability of data based on risk measurement methodology, evaluate the relevance of data for long-term planning, and ensure risk disclosure is delivered in a timely and transparent manner to stakeholders.

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20 (I) limited human, technological or data resources; (II) SMEs do not yet have an ESG data collection system; (III) it is not mandatory if capabilities are insufficient; (IV) 201; (V) opportunity: building internal capacity gradually; (VI) risk: late adaptation. (VII) triangulation: evaluation of the completeness and reliability of existing data through internal audits, development of HR training systems (relevance and accuracy), and periodic reporting to monitor the progress of data collection (timeliness and consistency).

21 (A) (I) reasons for not providing quantitative information; (II) limited data access; (III) increased transparency; (V) opportunity: more in-depth qualitative disclosure; (VI) risk: negative perception from stakeholders due to lack of numerical data. (VII) triangulation: ensure openness of reasons for data limitations (relevance and comprehensibility), ensure qualitative disclosure is sufficiently informative (completeness), and maintain consistency of reports to avoid negative perceptions (consistency and reliability).

21 (b) (i) affected items or subtotals in the financial statements such as: - revenues - operating expenses - fixed assets; (II) increased maintenance costs due to increased ambient temperatures in production facilities; (III) decreased profit margins, the value of fixed assets may depreciate faster; (IV) 201, 216, 207; (V) opportunities: facility improvements that improve energy efficiency; (VI) risks: short-term decline in profitability. (VII) triangulation: verify financial impact by auditing financial statements and maintenance records (accuracy and reliability), ensure reporting of changes in costs and assets is carried out in a complete and timely manner (completeness, timeliness), and evaluate the consistency of historical and current data.

21 (c) (I) combined estimates of annual financial losses, climate compliance costs, risk mitigation costs; (II) projected losses from combined flood risks and the cost of switching to renewable energy; (III) lower pretax earnings, increased loss reserves; (IV) 201, 210, 237; (V) opportunities: long-term risk reduction through adaptation; (VI) risks: financial burden from high mitigation costs. (VII) triangulation: synchronization of financial projections with risk reports and internal audits (accuracy and reliability), checking the completeness of combined risk data (completeness), and timely reporting to management and stakeholders (timeliness).

Strategy-Climate Resiliance

22 (I) resilience of the business model to climate scenarios; (II) analysis of +2°C and +4°C scenarios to supply chain and profitability; (III) decrease in revenue, increase in operating costs, adjustment of investment strategy; (IV) 201, 210, 236; (V) opportunities: increased operational efficiency through adaptation of business strategies; (VI) risks: decreased profitability and increased costs due to climate change. (VII) triangulation: ensuring the relevance and completeness of scenario analysis with current historical and projected data, the accuracy of financial impact calculations through audits, and consistent and timely reporting for decision-making.

22 (A) (I) strategic feasibility based on scenarios as of the reporting date; (II) annual evaluation of climate resilience in the sustainability report; (III) revision of cash flow assumptions, potential for impairment; (IV) 221, 208; (V) opportunity: adjustment of strategy to increase long-term value; (VI) risk: impairment of asset value due to changes in climate projections. (VII) triangulation: validate strategy assumptions with current market and policy data (relevance and reliability), ensure the completeness of annual evaluations, and ensure reports are prepared in a timely manner and can be understood by stakeholders.

22 (a) (i) (i) change in strategy or business model as a result of scenario analysis; (II) transfer of investment to renewable energy; (III) initial transition costs, potential for long-term cost efficiency; (IV) 236, 116; (V) opportunities: strengthening market position through renewable energy investments; (VI) risks: significant transition cost burden at the beginning of implementation. (VII) triangulation: verifies the accuracy of transition cost estimates and expected efficiency, completeness of investment data and financial impact reporting, and consistency of strategy communication with all relevant parties.

22(a) (ii) (I) identification of key uncertainties in climate resilience projections; (II) uncertainties in carbon prices, government policies, frequency of disasters; (III) volatility in estimated value of assets and liabilities, additional provisions; (IV) 201, 237; (V) opportunity: a more adaptive diversification strategy; (VI) risk: projected uncertainty affecting investment decision making. (VII) triangulation: assess the relevance and accuracy of uncertainty assumptions through industry benchmarking, ensure complete reporting of volatility and provisions, and

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communicate risks and opportunities clearly and in a timely manner.

22 (A) (iii) (I) adaptability (ratio of adaptation investment to total capital expenditure); (II) funds for facility relocation, energy efficiency investment; (III) reallocation of capital expenditure, additional financing needs; (IV) 201, 207, 26; (V) opportunities: improving asset resilience and energy efficiency; (VI) risks: additional funding burden for adaptation. (VII) triangulation: ensuring the reliability of investment and expenditure reallocation data through financial audits, evaluating the completeness of additional financing information, and ensuring consistent and timely reporting for management supervision. 22 (A)(iii) (1) (I) climate reserve fund to total assets/capital expenditure ratio; (II) climate change emergency fund, climate adaptation budget; (III) funding readiness, spending flexibility, impact on liquidity and leverage ratio; (IV) 201, 207; (V) opportunity: ensuring financial readiness to face climate disasters; (VI) risk: decreased liquidity due to reserve fund allocation. (VII) triangulation: verify the accuracy of reserve fund ratios and their impact on liquidity through financial statements, ensure completeness of budget allocations, and ensure information is reported in a timely and understandable manner for strategic decision making.

22(A) (iii) (2) (I) the entity's ability to transfer, reuse, upgrade, or retire existing assets; and; flexible asset to total asset ratio/frequency of climate asset transfers; (II) change in asset use from coal to renewable energy; (III) cost of asset retirement, asset termination, impact of changes in depreciation; (IV) 216, 236, 105; (V) opportunity: utilization of assets to support the energy transition; (VI) risk: loss of asset value due to termination of operations. (VII) triangulation: validation of data related to asset ratios and transfer frequency with accurate financial records (accuracy and reliability), completeness of retirement cost information, and timely and easy-to-understand reporting so that it can be used for strategic decision making.

22(A) (iii) (3) (i) total value of mitigation and adaptation investments / ROI of Climate Investments; (II) investments in water-efficient irrigation systems, solar panels, emission monitoring systems; (III) short-term capital expenditures, long-term efficiency potential, increase in asset value; (IV) 216, 238, 236; (V) opportunities: strengthening asset value through environmentally friendly technologies; (VI) risks: high initial capital expense. (VII) triangulation: measurement of ROI and capital expenditure must be complete and accurate, investment information presented consistently, and reported on time to facilitate management and stakeholder evaluation.

23 (I) list of standard metrics (GHG coverage 1, 2, 3, energy intensity, water, waste, etc.). (II) using TCFD's energy sector guidance for emissions and operational risk metrics. (III) errors in following relevant metrics may lead to less/more material risk disclosure. (IV) 201, 113. (V) opportunities: ensuring proper and standard-compliant risk disclosure, increasing investor confidence. Risk: the risk of inaccurate disclosure can damage reputation and impact investment decisions. (VII) triangulation: The consistent use of relevant metrics and standards guarantees the relevance and completeness of information, the accuracy of data ensured by internal controls, as well as the timely and understandable presentation by users of reports to improve the reliability of disclosure.

Risk Managements

24 (I) existence of a formal climate risk management process (yes/no), level of integration in the company's Risk Management; (II) risk policy document covering climate risk, Board of directors ' involvement in Climate Risk Evaluation; (III) failure to identify climate risk may result in material misstatement of assets or liabilities; (IV) 201, 210; (V) opportunity: strengthening risk governance through integration of climate issues; (VI) risk: misstatement of financial statements due to unidentified climate risk. (VII) triangulation: the quality of disclosure is assessed from the completeness of policy documents, accuracy of identified risk data, relevance and consistency of reporting with PSAK standards, and timely and understandable presentation by management and stakeholders to avoid misstatement.

25 (I) whether climate risk management information is available and structured; (II) systematic summary of climate risk reporting to management and the board; (III) low transparency may affect investor confidence and valuation; (IV) 201, 113; (V) opportunity: increased investor confidence through structured reporting; (VI) risk: loss of credibility due to low transparency. (VII) triangulation: Quality Evaluation based on the completeness of the risk report, the reliability and accuracy of the reported data, and the relevance and consistency of the information presented in a timely and understandable manner to improve transparency and credibility. 25 (a) (I) number of policies, sops, and documents supporting risk management processes; (II) sops for assessing the impact of extreme

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weather on supply chains; (III) without formal policies, climate-related financial risks can go undetected or unaddressed; (IV) 237, 109; (V) opportunities: standardize risk mitigation processes; (VI) risks: financial risks are missed in the absence of formal policies. (VII) triangulation: quality is measured from the completeness of supporting documents, the relevance of the policy to the actual risk, accuracy in risk evaluation based on sops, and consistency of policy implementation within the appropriate period for mitigation to be effective.

25 (A) (i) (I) sources of data used (internal/external), geographic scope of analysis, level of risk granularity; (II) using IPCC data for climate scenarios or historical data from BMKG; (III) use of irrelevant data may result in inaccurate estimates in asset valuation and cost/loss projections; (IV) 201, 336, 237; (V) opportunities: improving the accuracy of risk assessment with relevant data; (VI) risks: wrong estimation of asset value and cost due to incorrect data. (VII) triangulation: the quality of information is guaranteed through the accuracy and relevance of source data, completeness of risk coverage, consistency of analysis with PSAK standards, and presentation of data that can be understood and timely for decision making.

25 (A) (ii) (I) the number/type of climate scenarios used (eg. SSP, RCP), analysis Time; (II) use of IPCC ssp2-4.5 and SSP5-8.5 scenarios for flood and drought risk stress tests; (III) if no scenarios are used, long-term risks are not anticipated in asset valuation or business plans; (IV) 201, 336, 109; (V) opportunities: long-term planning based on scientific projections; (VI) risks: failure to anticipate long-term impacts. (VII) triangulation: assessing the quality of the completeness and relevance of the scenarios used, the accuracy of the application of risk analysis, the consistency of the implementation of standards, and the timeliness of reporting to support sustainable strategic decisions.

25(a) (iii) (I) Risk Assessment Methodology (qualitative/quantitative), materiality threshold, risk map; (II) risk matrix based on probability & annual financial impact > Rp10 billion; (III) inaccurate assessment may lead to presentation of financial information that does not reflect actual risk; (IV) 201, 210, 237; (V) opportunity: optimization of resource allocation through proper risk assessment; (VI) risk: misleading financial information resulting from incorrect assessment. (VII) triangulation: the quality of information is guaranteed through the accuracy of the risk assessment methodology used, the relevance of the materiality threshold, the completeness of the risk map, the consistency of the assessment with accounting standards, and the timely and understandable presentation of information to avoid misinterpretation of risk.

25 (a) (iv) (I) position of climate risk in the company's risk hierarchy, allocation of resources for mitigation; (II) climate risk is categorized as "high priority" in the company's Risk List; (III) abandonment of climate risk can lead to material losses not anticipated in financial planning; (IV) 201, 109; (V) opportunities: mitigation focus on high priority risks; (VI) risks: material losses due to neglected priority risks. (VII) triangulation: Quality Evaluation based on the relevance and consistency of risk classification in the hierarchy, completeness of mitigation resource allocation, accuracy of risk priority classification, and timely presentation so that major risks can be effectively addressed.

25(a) (v) (I) frequency of climate-related monitoring, monitoring systems, key performance indicators (KPIs); (II) GIS-based dashboard systems for real-time monitoring of flood-or forest fire-prone locations; (III) lack of monitoring may result in delayed response to extreme climate events, triggering unexpected losses; (IV) 201, 237, 109; (V) opportunities: rapid response to extreme events through real time monitoring; (VI) risk: loss due to delayed response. (VII) triangulation: the quality of disclosure is assessed by the completeness of the frequency and monitoring system used, the relevance of performance indicators to climate risk, the reliability and accuracy of realtime data, and the timeliness of reporting that enables quick and effective responses.

25(a) (vi) (i) changes in the number of process stages, new approaches, new technologies; (II) implementation of AI-based risk analysis replaces manual methods of previous years; (III) increased efficiency or changes in risk assumptions that have an impact on the calculation of reserves or fair value; (IV) 201, 210, 237; (V) opportunities: efficiency of risk analysis through AI technology; (VI) risks: dependence on technologies that have not been fully tested. (VII) triangulation: Quality Evaluation based on the relevance and consistency of risk classification in the hierarchy, completeness of mitigation resource allocation, accuracy of risk priority classification, and timely presentation so that major risks can be effectively addressed.

25 (b) (i) number of identified climate opportunities, assessment approaches, use scenarios; (II) identification of

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energy efficiency opportunities that result in reduced operating costs; (III) opportunities for increased profits through cost efficiency or increased revenue from low-carbon products; (IV) 201, 238, 109; (V) opportunities: increased profit margins from energy efficiency; (VI) risks: reliance on unrealized savings assumptions. (VII) triangulation: the quality of disclosure is assessed by the completeness of the frequency and monitoring system used, the relevance of performance indicators to climate risk, the reliability and accuracy of realtime data, and the timeliness of reporting that enables quick and effective responses.

25 (c) (I) the degree of integration of climate risk in ERM (Enterprise Risk Management), the involvement of the audit committee; (II) climate risk becomes one of the domains in the list of corporate risks, discussed in risk management meetings; (III) improving the reliability of risk estimates and allocation of resources, impacting management assumptions in the financial statements; (IV) 201, 210, 109; (V) opportunities: higher reliability of risk estimates; (VI) risks: financial statement assumptions miss due to weak integration. (VII) triangulation: verification of ERM documentation and audit committee meeting minutes (completeness, consistency), validation of risk estimation data with industry benchmarks (accuracy, relevance), and evaluation of periodic reporting of climate risk (timeliness, reliability).

26 (I) the existence of an Integrated Reporting System, Information consolidation approach; (II) ESG risk report is integrated with the Corporate Risk Report, with no repetition of data; (III) consistency of disclosure may affect the credibility of the annual report and investor perception; (IV) 201; (V) opportunity: increase the credibility of the annual report through the consistency of disclosure; (VI) risk: decrease in investor confidence due to inconsistent reporting. (VII) triangulation: Audit of integrated reporting systems (reliability, completeness), checking data consistency between reports (accuracy, consistency), and monitoring reporting schedules according to standards (timeliness, comprehensible).

Climate-Related Metrics

27 (I) percentage of climate targets achieved; applicable regulatory targets. (II) The 30% emission reduction Target was achieved by 28% in the reporting year. (III) climate targets that are not met may incur liability or penalties, and impair financial valuation. (IV) 201, 216. (V) opportunities: increase investor reputation and confidence with the achievement of targets. Risks: fines, financial liabilities and reputational losses if targets are not achieved. (VII) triangulation: the quality of information is evaluated based on the relevance of target achievement to the applicable regulations, the accuracy of measuring the percentage of achievement, the completeness of target reporting and realization, data consistency between periods, and the timeliness of reporting that reflects current conditions.

29 (I) list of relevant metrics: GHG emissions, energy consumption, water, waste. (II) key metrics: GHG 1, 2, and 3 coverage; annual energy and water use. (III) impact on cost efficiency, potential fines, low carbon technology investment needs. (IV) 201, 216, 237. (V) opportunities: cost efficiency and innovation of environmentally friendly products. (VI) risk: fines and additional charges if it does not meet standards or regulations. (VII) triangulation: quality evaluation includes the relevance of metric selection to risk and opportunity, accuracy of measurement of emissions and resource consumption, completeness of metric coverage (including all emission coverage), consistency of data between periods, and timeliness of reporting.

29 (a) (I) Total GHG emissions in CO2e. (II) Total annual emissions of 120,000 tons of CO2e. (III) high emissions may indicate exposure to future carbon costs or operational restrictions. (IV) 201, 29. (V) opportunities: the implementation of low-carbon technologies can reduce operational costs. Risks: high carbon costs, operational restrictions, and regulatory risks. (VII) triangulation: the quality of information is reviewed from the relevance of total emissions to strategy and risk, the accuracy of calculating CO2e emissions, the completeness of data covering all sources of emissions, the consistency of reporting data from year to year, and the timeliness of presenting information.

29 (A) (i) (i) annual gross emissions (Coverage 1 + 2 + 3 if relevant). (II) 85,000 tonnes of CO2e (Scope 1 and 2). (III) the basis for calculating mandatory carbon charges, carbon taxes, or carbon cap and trade schemes. (IV) 201, 237, 212. (V) opportunities: emission reductions can reduce carbon and tax costs. (VI) risk: increased carbon rates and higher tax liabilities. (VII) triangulation: Quality Evaluation is carried out through the relevance of emissions coverage to reporting standards, the accuracy and completeness of gross emissions data, the consistency of

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calculations and reporting over time, and the timeliness of reporting to support quick and appropriate decision making.

29(a) (i) (1) (I) Coverage of 1 CO2e per year. (II) emissions from the use of diesel in generators and operational vehicles: 35,000 tonnes of CO2e. (III) cause additional operating costs, equipment replacement obligations or penalties for regulatory limits. (IV) 201, 237, 201. (V) opportunities: fuel efficiency can reduce operating costs. (VI) risk: fines and equipment replacement costs if emissions limits are exceeded. (VII)triangulation: evaluation of Information Quality includes accuracy of emissions measurement Scope 1, relevance of operational-related data, consistency of annual emissions reports, completeness of data sources (e.g. fuel invoices), and timeliness of reporting.

29(a) (i) (2) (I) Scope 2: emissions from purchased electricity/energy. (II) 50,000 tons of CO2e from PLN electricity in production facilities. (III) increase in clean energy tariffs, potential fines if energy suppliers have not been low-carbon. (IV) 201, 33. (V) opportunities: using renewable energy can reduce costs and increase incentives. (VI) risk: increase in energy tariffs and risk of fines from regulators. (VII) triangulation: the quality of the data is assessed by the relevance of the source of electrical energy, the accuracy of calculating emissions from electricity consumption, the consistency of reporting data with previous periods, the completeness of information about energy sources, as well as the timeliness of reporting.

29(a) (i) (3) (I) Scope 3: indirect emissions from supply chains & other activities. (II) 110,000 tons of CO2e from third-party transportation, purchase of raw materials, use of consumer products. (III) reputational risk, investor expectations of supply chain carbon reduction, carbon footprint audit costs. (IV) 201, 237, 238. (V) opportunities: managing sustainable supply chains can strengthen market position. Risks: reputational risks and high costs for Supply Chain auditing and reporting. (VII) triangulation: scope 3 measurement must pay attention to the completeness and reliability of supply chain data, consistent calculation methods, accuracy of indirect emissions estimates, and openness to Transparent and timely reporting.

29 (A) (ii) (I) compliance with international standard measurement methods. (II) using the standard methodology of the corporate GHG protocol for coverage 1, 2, 3. (III) consistency of reporting is important for investor decision making and comparison between years. (IV) 201, 208. (V) opportunities: increase investor confidence with credible and standardized reporting. (VI) risk: method incompatibilities may result in misreporting and loss of trust. (VII) triangulation: quality is measured by the conformity of the methodology to international standards, transparency of the methodology, consistency in the use of the method over time, as well as the adequacy of documentation and audit reporting.

29 (A) (iii) (I) methodology, assumptions, and data used. (II) using IPCC emission factors, fuel consumption data from ERP, and automatic conversion in the reporting system. (III) data quality affects the credibility of reports and carbon cost estimates in financial statements. (IV) 201, 210. (V) opportunities: quality Data improves the accuracy of cost estimation and planning. (VI) risk: bad Data leads to cost estimation errors and financial risks. (VII) triangulation: quality assessment focuses on the validity and reliability of assumptions and data, the integration of data into reporting systems, the accuracy of emission factor-based calculations, and internal audits and validations.

29(a) (iii) (1) (I) assumptions & input data in GHG emission estimation. (II) emission factor: 2.67 kg CO2/liter diesel; annual consumption based on fuel purchase invoice. (III) if assumptions are too conservative/lax, it may lead to the presentation of climate costs that are too high in the financial statements. (IV) 210, 201. (V) opportunities: realistic assumptions help with effective management of carbon costs. (VI) risk: false assumptions lead to inaccuracies in financial statements and audit risks. (VII) triangulation: the quality of information is measured by the accuracy of emission factor assumptions, the accuracy of fuel consumption data, the transparency of assumptions, and the consistency of the application of assumptions in financial reporting.

29(A) (iii) (2) (I) methodological justification. (II) the activity-based approach is chosen because the data is more accurate than the ERP system. (III) a more conservative approach can improve climate cost estimates. (IV) 210, 201. (V) opportunities: appropriate methodologies enhance the credibility and effectiveness of risk management. (VI) risk: improper methodology may increase cost estimation without a clear basis. (VII) triangulation: the quality of information depends on the validity of the method justification, the relevance of ERP data, transparency in the choice of approach, and consistency with standard practice.

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29(A) (iii) (3) (I) change of approach. (II) this year it uses local emission factors instead of global IPCC because of higher relevance. (III) changes in assumptions affect the consistency of reports and comparisons from year to year. (IV) 208, 201. (V) opportunities: adjustments improve the accuracy and relevance of reports. Risk: changes in assumptions lead to inconsistency and confusion of stakeholders. (VII) triangulation: quality is assessed from the transparency of the change methodology, documentation of the impact of the change, as well as the effectiveness of communication to stakeholders.

29 (A) (iv) (I) GHG emissions per organizational structure. (II) 150,000 tons of CO2e from parent and subsidiaries; 20,000 tons from joint ventures. (III) disaggregation indicates the share of emissions that are not fully controlled, thus affecting mitigation strategies. (IV) 110, 228. (V) opportunities: identification of emissions per unit helps mitigation strategies be more focused. (VI) risks: reliance on joint venture entities may pose reputational and reporting risks. (VII) triangulation: validation of emission data through internal environmental reports and third party audits (accuracy, reliability), checking data consistency between parent and subsidiary (consistency, completeness), and timely reporting according to standards (timeliness, comprehensible).

29(a) (iv) (1) (I) Consolidated coverage of 1 & 2; 150,000 tons of CO2e from manufacturing and logistics subsidiaries. (II) full responsibility for these emissions. (III) include potential carbon costs and environmental taxes. (IV) 201, 110. (V) opportunities: full emissions management can lower carbon costs and improve efficiency. (VI) risk: tax liabilities and carbon costs may increase without effective controls. . (VII) triangulation: internal and external audits of emissions measurements (accuracy, reliability), consistency of reporting between business units (consistency), and periodic data updates (timeliness).

29(a) (iv) (2) (I) Coverage 1 & 2 of an unconsolidated investment company. (II) 20,000 tons of CO2e from joint venture companies in the mining sector. (III) indirect financial impact, reputational risk, additional disclosure. (IV) 228, 111, 112. (V) opportunities: transparency of disclosure enhances credibility and risk management. (VI) risk: reputational risk and potential demands from stakeholders. (VII) triangulation: verification of emission reports from venture companies (accuracy, reliability), consistency of disclosures in financial statements (consistency), and timely reporting in accordance with regulations (timeliness).

29 (A) (v) (I) emission coverage 2: location-based vs. market-based. (II) 100,000 tons of location-based CO_2e; 80,000 tons of market-based green energy contracts. (III) renewable energy contracts result in a reduction in the energy purchase burden and incentive potential. (IV) 116, 109. (V) opportunities: using green energy reduces costs and improves the company's image. Risk: risk of fluctuating green energy prices and dependence on long-term contracts. 29 (a) (IV) (i) total emissions coverage 3 and distribution by Category. (II) 1.2 million tonnes of CO_2e, with 60% coming from logistics and the purchase of raw materials. (III) large amounts of indirect emissions may affect supply chain and reputational risk. (IV) 201, 33. (V) opportunities: identify opportunities for efficiency and green innovation in the supply chain. (VI) risk: exposure to reputational risk and incidental costs due to indirect emissions is high. (VII) triangulation: validation of emissions data based on location and market through contracts and energy meters (accuracy), checking the consistency of data between internal and external sources (consistency), and periodically updated reports (timeliness).

29(a) (IV) (1) (I) emissions per coverage Category 3 (ex: purchased goods and services, transportation, etc.). (II) category 1 (purchased goods and services): 500,000 tonnes CO_2e; Category 9 (downstream transport): 150,000 tonnes CO_2e. (III) illustrate indirect risks and potential supply chain costs that will increase. (IV) 202, 23. (V) opportunities: optimization of procurement and logistics to reduce emissions and costs. (VI) risk: increased costs and operational disruption if the supply chain is not environmentally sustainable. (VII) triangulation: supply chain audits and validation of emissions by third parties (accuracy, reliability), consistency of category emissions reporting (consistency), and transparent and timely reporting (timeliness, comprehensible).

29(a) (IV) (2) (I) financed emissions (Category 15). (II) investment in the oil and gas sector generates 300,000 tonnes of CO_2e. (III) the risk of exposure to high carbon assets, the potential for derelict assets. (IV) 109, 113. (V) opportunities: diversify investments into green sectors to reduce carbon risk. (VI) risk: declining asset values and risk of stranded assets due to regulation and market shifts. (VII) triangulation: validation of investment and emission data by financial statements and external audits (accuracy, reliability), consistency checks between investment

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portfolios and emission reports (consistency, completeness), and periodic reporting in accordance with standards (timeliness).

29 (b) (I) amount & % of assets at risk of transition. (II) 40% of the asset portfolio (Rp 200 billion) is in the coal and oil and gas sectors. (III) risk of impairment of carrying value due to climate regulation, asset revaluation, changes in business assumptions. (IV) 201, 109, 201. (V) opportunities: transition management can open up new business opportunities and increase asset value. (VI) risk: impairment of assets and large revaluation costs due to the energy transition. (VII) triangulation: verification of asset and risk values through internal financial statements and external audits (accuracy, reliability), consistency of transition risk data between documents (consistency), and timely reports in accordance with regulatory provisions (timeliness).

29 (c) (I) % of assets or business activities located in climate disaster-prone areas. (II) 30% of assets (Rp150 billion) located in flood-prone areas. (III) decrease in asset value, damage to fixed assets, increase in maintenance costs. (IV) 216, 236. (V) opportunities: disaster mitigation investments can reduce losses and strengthen business resilience. (VI) risk: physical damage to assets and high costs due to climate disasters. (VII) triangulation: asset location and Disaster Risk Data are verified with government and third party data (accuracy, reliability), reporting consistency between business units (consistency), and reporting that is updated and easy to understand (timeliness, comprehensible).

29 (d) (I) percentage of assets/activities related to renewable energy, efficiency, etc. (II) investment of Rp50 billion for energy efficiency = 10% of total assets. (III) potential energy savings, tax incentives, environmentally friendly business growth. (IV) 238, 216, 201. (V) opportunities: operational cost savings and corporate image improvement. (VI) risk: high initial investment risk and dependence on new technologies. (VII) triangulation: confirmation of investment value and efficiency achievement through financial statements and technology audits (accuracy, reliability), consistency of investment reporting across units (consistency), and timely periodic reporting (timeliness).

29 (e) (I) total annual climate investment. (II) investment of Rp70 billion for electric vehicles and environmentally friendly buildings. (III) changes in cost structure, long-term capital expenditure, long-term value added. (IV) 238, 116, 33. (V) opportunities: long-term added value, access to new markets, and government incentives. (VI) risk: large capital burden and immature technology risk. (VII) triangulation: validation of investment value and financial impact through financial statements and independent audits (accuracy, reliability), consistency of annual investment data (consistency), and timely reporting (timeliness).

29(f) (I) internal carbon price per tonne of CO_2e. (II) Rp200, 000/ton CO_2e for investment decision making. (III) adjustment of project value, impact on rate of return on investment (IRR), feasibility of the project. (IV) 336, 201, 109. (V) opportunities: encourage sustainable investment by accounting for carbon costs. (VI) risk: project assessments become less accurate if internal carbon prices are unrealistic. (VII) triangulation: carbon pricing is verified by market and internal policy standards (accuracy, reliability), consistency in the use of carbon pricing in various investment analyses (consistency), and periodic price evaluation (timeliness).

29(f) (i) (i) the use of carbon pricing in corporate financial models. (II) carbon pricing is used in energy project feasibility studies and sensitivity models. (III) provide a basis for internal policy decisions, impact on project value and financial projections. (IV) 201, 109, 113. (V) opportunities: strengthen financial planning and green investment. (VI) risk: dependence on the assumption that carbon prices are subject to change. (VII) triangulation: validation of the use of carbon pricing through internal and external audits (accuracy, reliability), consistency of carbon pricing applications across various financial models (consistency), and periodic reporting (timeliness).

29(g) (i) (i) the existence of ESG criteria (environmental, social, governance) in the remuneration scheme. (II) CEO bonuses are contingent on achieving the 10% emissions reduction target. (III) encourage pro-environmental behavior that impacts operational results. (IV) 219. (V) opportunities: increase management's commitment to sustainability targets. (VI) risk: risk of data manipulation to achieve target remuneration. (VII) triangulation: verification of target achievement data through internal monitoring reports (accuracy), checking the suitability of remuneration policies with practices (consistency, completeness), and timely reporting of incentives (timeliness).

29(g) (ii) (I) percentage of remuneration attributable to climate targets. (II) 20% of total management remuneration

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is attributed to ESG performance indicators. (III) may affect the total cost of salaries and compensation based on achieving climate targets. (IV) 219, 201. (V) opportunities: strengthening the culture of sustainability in the organization. (VI) risk: additional cost burden if the target is difficult to achieve. (VII) triangulation: consistency of remuneration data and target achievement in financial and HR statements (consistency, completeness), validation of remuneration data by internal auditors (accuracy, reliability), and timely reporting (timeliness).

30 (I) use of appropriately available and verifiable data. (II) use of emission inventory data from environmental audit reports. (III) reduce the risk of misreporting or waste of climate reporting costs. (IV) 201, 208. (V) opportunities: improve Report reliability and stakeholder confidence. (VI) risk: high verification costs and the risk of late reporting. (VII) triangulation: verification of data by external auditors (accuracy, reliability), consistency of data between reporting periods (consistency), and timely reporting according to standards (timeliness).

31 (I) compliance with additional disclosure guidelines. (II) refer to the sector list (e.g. energy, mining) in Annex B of IFRS S2. (III) may reduce the risk of misreporting or inadequate disclosure. (IV) 201, 208. (V) opportunities: improve transparency and accuracy of sustainability reports. (VI) risk: administrative burden and risk of non-conformance of guidance interpretation. (VII) triangulation: auditors check compliance (accuracy, reliability), consistency of disclosures across documents (consistency), and reporting on schedule (timeliness).

32 (I) industry metrics in accordance with the SASB (ex: emission intensity per barrel of oil for the energy sector). (II) emission intensity (kg CO_2e/ton of cement produced) in the cement industry. (III) may affect future cost projections, efficiency calculations, and sector climate strategies. (IV) 201, 328. (V) opportunities: helps benchmarking and efficiency improvement of industrial sectors. (VI) risk: inconsistent recording risk may affect strategy analysis. (VII) triangulation: verification of metrics with SASB standards and external audits (accuracy, reliability), data consistency between periods and between companies (consistency), and periodic reporting according to standards (timeliness).

Climate-Related Targets

33 (I) the number of climate targets disclosed, both quantitative and qualitative. (II) the Target of reducing GHG emissions by 30% by 2030. (III) changes in operating costs, investment in low-carbon technologies. (IV) 201, 237. (V) opportunities: spur innovation and sustainable investment. (VI) risk: financial risk if the target is not reached on time. (VII) triangulation: validation of targets through official company documents and internal audit reports (accuracy, reliability), consistency of targets with company policies (consistency), and periodic reporting of targets and progress (timeliness).

33 (a) (I) target-specific metrics (eg. kg CO_2e/unit of product, renewable energy / total energy). (II) carbon emission intensity: kg CO_2e/barrel of oil. (III) affect the evaluation of efficiency and investment in the production line. (IV) 113. (V) opportunities: help measure efficiency and optimize production processes. Risk: inaccurate metric Data can lead to erroneous investment decisions. (VII) triangulation: metric measurements are verified through internal monitoring systems and external audits (accuracy, reliability), measurement consistency across periods (consistency), and timely reporting (timeliness).

33 (b) (I) classification of target objectives (mitigation/adaptation/CBT). (II) a Net Zero Target aligned to 1.5°C by 2050. (III) company reputation, access to green financing. (IV) 201, 107. (V) opportunities: improving corporate image and green funding opportunities.(VI) risk: pressure to adapt strategy and reporting to global standards. (VII) triangulation: target conformance to international standards is verified through external review (accuracy, reliability), consistency of communication and reporting (consistency), and timely submission of reports (timeliness).

33 (c) (I) target coverage in the organizational structure. (II) Target applies only to energy & logistics units. (III) inconsistent implementation may trigger operational or legal risks. (IV) 210. (V) opportunities: focus resources on critical areas for optimal results. (VI) risk: risk of non-compliance and potential legal sanctions. (VII) triangulation: documentation of clear target coverage policies (completeness), internal audits related to implementation in related units (accuracy, reliability), and periodic reporting (timeliness).

33 (d) (I) early and late year targets. (II) 2020-2030, with a review in 2025. (III) affect the assumption of future cash flows, investment feasibility. (IV) 336. (V) opportunities: adjustment of strategies according to business dynamics

and climate. (VI) Risk: Uncertainty in long-term financial planning. (VII) triangulation: validation of target schedules through strategic planning documents (completeness), consistency of target revisions with business dynamics (consistency), and timely review reporting (timeliness).

33 (e) (I) the target year. (II) base year: 2019 (before the pandemic). (III) the selection of the base year has an impact on historical financial baselines & trends. (IV) 201. (V) opportunities: using representative historical data for planning. (VI) risk: a less relevant base year may mislead trend analysis. (VII) triangulation: verification of base year data through historical financial documents (accuracy, reliability), consistency of use of the base year in reports (consistency), and timely reporting of base year information (timeliness).

33 (f) (I) number of milestones & interim targets set. (II) annual emission reduction Target of 5%/year. (III) help project recurring funding needs for climate initiatives. (IV) 30, 34. (V) opportunities: facilitate the management and monitoring of progress. (VI) risk: the risk of unrealistic short-term targets lead to financial pressure. (VII) triangulation: validation of annual targets with internal monitoring reports (accuracy), periodic reporting (timeliness), and consistency of annual targets with long-term targets (consistency).

33 (g) (I) target type: absolute or intensity. (II) absolute Target: 1 million tons of CO_2e/year, or intensity: 0.25 tons of CO_2e/unit. (III) intensity provides flexibility for growth; absolute provides constant pressure. (IV) 236. (V) opportunity: choose the type of target that fits the growth strategy. (VI) risk: absolute targets may be difficult to achieve when the business is growing rapidly. (VII) triangulation: confirmation of target types through company policy (completeness), verification of measurement consistency between periods (consistency), and timely periodic reports (timeliness).

33 (h) (I) changes in global climate policies or commitments that affect the target. (II) target adjustments to the Paris Agreement or NZE 2050. (III) targets need to be revised, thereby triggering a potential reassessment of investment strategies. (IV) 210. (V) opportunities: conforming to international standards increases credibility. (VI) risk: frequent target revisions can lead to strategy uncertainty. . (VII) triangulation: Monitoring global policy developments through reliable sources (accuracy, relevance), documentation of revision targets (completeness), and timely reporting of revisions (timeliness).

34 (I) target setting and review approaches, as well as monitoring systems. (II) SBTi-based target setting, reviewed twice a year, monitored through the GHG dashboard. (III) increase transparency & reduce the risk of green litigation. (IV) 201, 105. (V) opportunities: increase investor confidence and regulatory compliance. Risk: the cost and resources required for regular monitoring and reporting. (VII) triangulation: validation of the monitoring system through internal audits (reliability), evaluation of the consistency of the review process twice a year (consistency), and timely reporting to stakeholders (timeliness).

34 (a) (I) Third party validation Status. (II) emission targets validated by SBTi. (III) validation increases credibility, encourages access to green finance. (IV) 201, 107. (V) opportunities: strengthening the company's position in the Green Market and financing. (VI) risk: reliance on third-party validation that could create process bottlenecks. (VII) triangulation: confirmation of validation through official SBTi certificates (reliability, accuracy), validation reporting in public documents (completeness), and timely delivery of validation results (timeliness).

34 (b) (I) target review frequency & process. (II) annual review by the ESG Committee. (III) periodic reviews may trigger adjustments to budget allocations & operational plans. (IV) 210. (V) opportunities: adaptation of strategies that are responsive to changing conditions. (VI) risk: repeated adjustments can lead to internal uncertainty. (VII) triangulation: documentation of review schedules (completeness), reports on the results of regular reviews (timeliness), and consistency in the implementation of the review process each year (consistency).

34 (c) (I) progress monitoring metrics. (II) tCO_2e/year, energy intensity/unit of production. (III) monitoring allows anticipating the impact of operating costs. (IV) 23. (V) opportunities: cost control and efficiency improvement. (VI) risk: inaccurate monitoring Data may mislead decisions. (VII) triangulation: validation of monitoring data through internal audit (accuracy, reliability), periodic reporting and Information Systems (timeliness), and consistency of measurement methods between periods (consistency).

34 (d) (I) revisions & reasons for target changes. (II) the Target was revised from 20% to 30% due to new regulations.

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(III) target revisions may affect asset valuations and investment plans. (IV) 237, 336. (V) opportunities: adjusting to the latest regulations and markets. (VI) risk: too frequent revisions can lead to confusion and additional costs. (VII) triangulation: documentation of target changes with formal justification (completeness), communication of revisions to stakeholders (comprehensibility, timeliness), and consistency of implementation of revision targets (consistency).

35 (I) achievement of climate target realization & trend analysis. (II) achieving 5% emission reduction per year for 3 years. (III) actual performance affects investor confidence & reputational risk. (IV) 201, 210. (V) opportunities: increase market reputation and trust. (VI) risk: poor performance poses reputational and financial risks. (VII) triangulation: verification of target achievement data with external audits (accuracy, reliability), easy-to-understand and transparent trend reports (comprehensible), and timely reporting (timeliness).

36 (I) completeness of GHG emission target disclosure. (II) target disclosure of CO_2, CH_4 as per 33-35. (III) consistency & completeness affect the credibility of ESG reporting and assessment. (IV) 201, 210. (V) opportunities: increase transparency and stakeholder trust. (VI) risk: incomplete or inconsistent disclosures may degrade credibility. (VII) triangulation: examination of the completeness of disclosure through standard checklists (completeness), consistency of content between annual reports (consistency), and audit of reported information (reliability).

36 (a) (I) types of GHGs covered. (II) CO_2, CH_4, N_2O. (III) the type of GHG affects the long-term mitigation cost scenario. (IV) 237, 116. (V) opportunities: addressing all relevant gases provides a complete overview. Risk: the complexity of measuring and controlling various gases. . (VII) triangulation: verification of gas types Through Environmental Reporting Standards (accuracy, reliability), complete reporting of each type of gas (completeness), and measurements carried out periodically (timeliness).

36 (b) (I) emission scope: scope 1, 2, 3. (II) Scope 1 & 2 for direct operations; Scope 3 logistics. (III) coverage Target 3 is high risk due to supply chain dependency. (IV) 201, 30. (V) opportunities: manage supply chain risks and improve efficiency. (VI) Risk: Uncertainty and limitation of control over emissions coverage 3. (VII) triangulation: confirmation of emission coverage through internal inventory data (accuracy), supply chain mapping documentation (completeness), and periodic update of emission reports (timeliness).

36 (c) (I) Gross or net emissions Target. (II) Zero Net CO_2 by 2040, with a gross target of 2030. (III) net targets require offsetting investments that affect cash flow. (IV) 336, 109. (V) opportunity: a long-term strategy that is sustainable and accepted by the market. (VI) risk: the long-term financial burden of carbon compensation investments. (VII) triangulation: official target documents and investment plans (completeness), validation of financial assumptions (accuracy), and periodic progress reporting (timeliness).

36(d) (i) (i) sectoral approach. (II) emission targets based on Science Based Targets (SBTi) for the energy sector. (III) sectoral targets may encourage early capital expenditure and risk of stranded assets. (IV) 216, 236. (V) opportunities: focus on sectors with the greatest impact for mitigation effectiveness. (VI) risk: the risk of investing in assets that are no longer economically viable (stranded assets). (VII) triangulation: verification of sectoral targets through SBTi certification (reliability), documentation of energy sector capital expenditure (completeness), and periodic review of target effectiveness (timeliness).

36(e) (i) (I) plan to use carbon credits to offset emissions. (II) a plan to offset the 30% net zero target of carbon credits. (III) carbon credit acquisition costs → future expenses, potential liabilities. (IV) 237, 116. (V) opportunities: facilitate the achievement of the net zero target. (VI) risk: dependence on carbon credit markets and price volatility. (VII) triangulation: planning documents for the use of carbon credits (completeness), proof of carbon credit transactions (accuracy, reliability), and regular credit market price updates (timeliness). 36(e) (i) (i) the proportion of target achievement depends on the offset. (II) 50% of the 2040 target will be achieved through offsets. (III) High Dependency → reputational risk and cost uncertainty. (IV) 201, 210. (V) opportunity: enables faster achievement of targets at a lower cost. (VI) risk: over-reliance on offsets can undermine credibility and pose a regulatory risk. (VI) risk: over-reliance on offsets can undermine credibility and pose a regulatory risk. (VII) triangulation: analysis of the proportion of offsets in overall targets (completeness), evaluation of reputational risks from independent audits (reliability), and transparent reporting to stakeholders (comprehensibility and timeliness).

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36(e) (ii) (I) Third party carbon credit certification. (II) verification by Gold Standard or Verra. (III) the credibility of the third party affects the economic value of the indemnity. (IV) 30, 201. (V) opportunities: increase investor and stakeholder confidence. (VI) risk: dependence on external standards that may change and impact the validity of carbon credits. (VII) triangulation: verification of third-party certificates (accuracy, reliability), compliance with international standards (completeness), and regular certification reporting (timeliness).

36(e) (iii) (I) types of carbon credits and methods of offset. (II) nature-based (reforestation) or technology-based (CCS) compensation. (III) loss-making technology → high capital expenditure, additional operating costs → impact on profit and balance sheet. (IV) 216, 116, 236. (V) opportunity: accelerate the green transition with cutting-edge technology. (VI) risk: large financial burden and immature technology risks. (VII) triangulation: technical documents of carbon credit types (completeness), financial evaluation of investment and operating costs (accuracy), and updates on implementation progress (timeliness).

37(e) (iv) (I) credibility factors and assumptions relating to indemnity. (II) forest sustainability assumption, 20-year monitoring of loss reimbursement. (III) accounting risk if the assumption of sustainability fails → impairment of assets or recognition of liabilities. (IV) 237, 109, 236. (V) opportunities: encourage long-term sustainable practices and risk management. (VI) Risk: Uncertainty in the long term that may affect the financial statements. (VII) triangulation: validation of sustainability assumptions through environmental audits (accuracy, reliability), documentation of monitoring plans (completeness), and regular reporting of monitoring results (timeliness).

37 (I) metrics and indicators used for target monitoring. (II) emission intensity per ton of product, annual emission reduction in tCO_2e. (III) metric Data underlying projected cash flows, environmental capital expenditures, and related costs. (IV) 201, 210, 216, 116. (V) opportunities: support strategic decision making and reporting transparency. (VI) risk: reliance on accurate and consistent data; risk of misreporting. (VII) triangulation: Crosscheck metric data with internal monitoring system (accuracy, reliability), complete and standard data collection (completeness), as well as metric reports submitted periodically (timeliness).

Disclosure of IFRS 2 Indicators has an impact on PSAK Finances and References

Here is a summary of the main concepts of PSAK with foreign terms commonly used in accounting and financial reporting:

PSAK 201-presentation of financial statements Basic concept: assets are equal to liabilities plus equity. Profit or Loss increases equity through retained Earnings. In the Consolidated Statements, the assets and liabilities of subsidiaries are combined with those of the parent, with adjustments for goodwill and Noncontrolling interests. PSAK 110-Consolidated Financial Statements Consolidation is carried out by combining the assets and liabilities of the parent and subsidiaries in full. Goodwill is calculated as the difference between the Purchase Price and the net Assets acquired. Non-controlling interests are recognized in accordance with the portion of ownership. PSAK 114 - Defined Benefit Plans Defined benefit obligations are calculated as the Present Value of Future Benefit obligations minus Plan Assets. Deficits or surpluses are recognized in equity through Other Comprehensive Income.

PSAK 117 - insurance Contracts Underwriting Profit is calculated from Premiums Received minus Claims and Direct Expenses. The impact affects cash, Claim Liabilities, and equity.

PSAK 237-Provisions and Contingent Liabilities Provisions are measured based on the Present Value of Expected Cash Outflows, if the obligation is material and needs to be discounted. Recognition of provisions increases liabilities and reduces equity through expenses.

PSAK 219-Employee Benefits Employee benefit obligations are calculated using the actuarial method using the Present Value of estimated future benefits. Current Service costs are recognized immediately as expenses that reduce equity.

PSAK 107-Financial Instruments: Disclosures The Fair Value of financial instruments is measured using a Market Approach or Discounted Cash Flows. Disclosures include Valuation Techniques and fair Value Sensitivity to changes in assumptions.

PSAK 236 - Impairment of Assets Impairment Loss is calculated as the difference between the carrying Amount and

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the Recoverable Amount of an asset, which is the highest value between Fair Value less Costs to Sell and Value in Use, the present value of expected future cash flows.

Table 4 IFRS S2 Step 2-Risk and Opportunity Mapping

Paragraph	Indicator	Accounting Category	Type of Transaction	Opportunity	Risk
6(a)	Governance committee formation	Operational Expense	Establishment of ESG committees	Improved ESG governance capacity	Increased admin overhead
6(a)(i)	SOP for board roles in sustainability oversight	Administrative Expense	Policy drafting and compliance documentation	Role clarity; improved decision-making	Internal resistance; change management costs
6(a)(ii)	Board-level climate competency development	HR Expense	Climate training and certification programs	Enhanced climate literacy and strategic alignment	Recurrent training expenditure

The findings demonstrate that the IFRS S2 disclosure framework can be operationalized into measurable indicators that are contextually relevant to Indonesian corporate reporting practices. Through systematic mapping to PSAK standards, these indicators support localization and ensure regulatory coherence.

Readiness

1. Company Readiness

2. IAI readiness

3. Readiness Of Public Accountants

4. Academic Readiness

Q: Question. A: readiness analysis T: Theme

1. Company Readiness

Risks and opportunities related to sustainability

Q1: How is corporate governance in managing risks and opportunities related to sustainability?

Q: governance of sustainability risks and opportunities

A: if the company has a clear governance structure and mechanisms for monitoring risks and sustainability opportunities, then the readiness of governance is considered good.

Q2: does the company already have a specific strategy to leverage opportunities and effectively manage sustainability risks?

Q: sustainability risk and Opportunity Management Strategies

A: if a measurable and implemented strategy has been developed to address risks and take advantage of sustainability opportunities, then the company is strategically prepared.

Q3: what is the risk management process in identifying, measuring, and mitigating sustainability risks?

Q: Sustainability Risk Management

A: if the company has a systematic and documented system for managing sustainability risks, then risk management readiness is adequate.

Q4: has the company established metrics and performance targets related to sustainability risks and opportunities

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that can be monitored on a regular basis?

Q: sustainability metrics and targets

A: if specific, measurable, and relevant metrics and targets have been applied to measure the performance of sustainability risk and opportunity management, then measurement and reporting readiness is good. Climate-related risks and opportunities

Q5: How is corporate governance in managing risks and opportunities related to climate change?

Q: Climate Risk and opportunity governance

A: if the company has integrated the management of climate risks and opportunities into the governance and decision-making structure, then the climate governance readiness is good.

Q6: has the company developed a strategy to anticipate and exploit the risks and opportunities arising from climate change?

Q: Climate Risk and Opportunity Management Strategies

A: if a clear and sustainable climate strategy has been designed and implemented, then the company's strategic readiness is guaranteed.

Q7: How do companies manage climate risk through effective risk management processes?

Q: Climate Risk Management

A: if the process of identification, evaluation, and mitigation of climate risks is carried out systematically and supported by accurate data, then the readiness of climate risk management is adequate.

Q8: has the company set metrics and targets related to managing climate risks and opportunities that can be measured and reported?

Q: climate metrics and targets

A: if specific and regularly monitored climate metrics and targets are in place, the preparedness for Climate Risk Reporting and monitoring is strong.

Q9: what are some of the major impacts of climate change that organizations may feel, particularly regarding resource availability, supply, pricing, and regulation?

T1: PSAK 201, PSAK 210, PSAK 202, PSAK 241 / IFRS 1, IAS 2, IAS 37

A1: mention specifically the impact on production costs, selling prices, revenues, operating expenses, and potential liabilities identified. The company has identified ready.

Q10: How can organizations identify and manage operational and financial risks arising from climate change? T2: SFAS 107, SFAS 109 / IFRS 7, IFRS 9

A2: mention the methods of measuring and managing financial risk quantitatively and qualitatively. The company has identified ready. Q11: can Climate Change cause disruptions in supply chains or markets for organizations? If so, what is the likely response of the organization?

T3: PSAK 202, PSAK 241 / IAS 2

A3: mention the type of Disruption (Delay in supply, increase in cost, loss of customers) and mitigation strategies. The company has identified ready. Q12: does the organization see opportunities from climate change, such as in green technology innovation, energy efficiency, or sustainable product development?

T4: SFAS 238, SFAS 113 / IAS 38, IFRS 13

A4: mention the opportunity and estimated financial impact (cost savings, increased revenue). The company has identified ready.

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Q13: How do organizations integrate these opportunities into business strategies to improve competitiveness?

T5: PSAK 201, PSAK 210 / IAS 1

A5: mention strategic plans and financial impact projections. The company has identified ready.

Q14: to what extent can organizations identify, measure and report on climate change-related material impacts, risks and opportunities in sustainability reports or annual reports?

T6: PSAK201, PSAK210, PSAK107 / IAS1, IFRS7

A6: mention the metrics and measurement indicators connected to the financial statements. The company has identified ready. Q15: What are the main challenges organizations may face in disclosing relevant and complete information on climate change impacts?

T7: PSAK 201, PSAK 208 / IAS 1, IAS 8

A7: mention data limitations, reporting costs, and accounting system gaps. The company has identified ready.

Q16: How do the impacts, risks, and opportunities posed by climate change, such as supply disruptions, price fluctuations, regulatory demands, and innovation opportunities, affect the company's financial position, and what is the role of accounting in identifying, measuring, and reporting on these aspects in sustainability and financial statements?

T8: PSAK201, PSAK210, PSAK241, PSAK109 / IAS1, IAS8, IFRS9

A8: mention specific impacts to assets, liabilities, equity, income, and expenses. The company has identified ready.

Q17: how does the Accounting Information System prepare sustainability reports that can be integrated with the company's financial statements?

T9: PSAK 201, PSAK 208 / IAS 1, IAS 8 A9: mention the integration of the Financial Reporting module with the sustainability module. The company has identified ready. Q18: from the point of view of Accounting Information Systems, what are the challenges of organizations in integrating sustainability reports with financial statements? T10: PSAK 201, PSAK 208 / IAS 1, IAS 8

A10: mention the limitations of infrastructure, data quality, and integration processes. The company has identified ready. 2. IAI readiness

Q1: has IAI, as a charter standard, identified the relationship between sustainability reports and financial statements?

Q: connectedness of Standards and regulations A: if IAI states that it has officially recognized and included this connection in its standards or guidelines, it indicates its conceptual and regulatory readiness to Support Integrated Sustainability Reporting.

Q2: what are the concrete steps of IAI in supporting the implementation of IFRS S1 and IFRS S2 in Indonesia? T: implementation and socialization steps A: if IAI has conducted socialization, issued technical guidance, and formed a special team that focuses on sustainability standards, this shows the readiness of the organization in encouraging the adoption of new standards.

Q3: has IAI provided special training or socialization for its members regarding this Sustainability Reporting Standard? T: training and competency development A: if IAI actively conducts training, webinars, workshops, and certification related to sustainability reporting, then the human resources of members are ready to face changes in standards.

Q4: what is the role of IAI in developing assurance standards for sustainability reports?

Q: Development Of Assurance Standards

A: if IAI is involved in the process of developing or adapting sustainability assurance standards both at national and international levels, it shows readiness to expand the scope of the accounting profession.

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Q5: what are the biggest challenges faced by IAI in overseeing the implementation of IFRS S1 and S2 among professional accountants?

Q: challenges and mitigation strategies A: if IAI recognizes challenges such as lack of understanding of members, limited data, or the need for harmonization of standards, but also has a mitigation plan, then the readiness to face these obstacles is relatively good.

Q6: to what extent has IAI collaborated with regulators or other institutions in preparing standards and readiness of the accounting profession to face sustainability reporting?

Q: collaboration with regulators and stakeholders

A: if IAI actively cooperates with OJK, ministries, and international associations, this indicates a high commitment and readiness in supporting the implementation of sustainability standards.

Q7: how does IAI encourage its members to improve their competencies related to sustainability reporting and assurance?

T: Member Competency Improvement

A: if IAI provides continuing education materials, certification, and training programs, then the readiness of human resources in the profession is good enough.

Q8: does IAI have a roadmap or long-term strategic plan related to the integration of sustainability reporting into accounting practices in Indonesia?

T: roadmap and organizational strategy

A: if IAI has formulated and communicated a clear and structured roadmap, it shows the readiness of the organization's vision and strategy in supporting sustainability reporting. 3. Academic Readiness

Q1: How can a forward-looking information recording system be designed to be reliable as part of financial information and reflect its impact on the company's cash flow?

T: PSAK/IFRS - (percentage Value) A: if an academic can identify and integrate relevant and reliable future cash flow estimates into financial statements, and understand their impact on measuring assets, liabilities, and results of operations, then the academic is ready to understand the application of this standard.

Q2: How do I estimate losses due to chronic physical risks, and how is the accounting treatment in the financial statements? T: 210, 236

A: if the academician is able to explain the type of loss due to chronic physical risk, the quantitative estimation method used (for example: estimated fair value loss or impairment loss), and the appropriate accounting treatment according to the recognition and measurement standards of related assets or liabilities, then the academician is ready.

Q3: can the impact of drought risk that is uncertain but can affect operating cash flow be categorized as contingent liabilities, and how should the company disclose it in the financial statements? T: PSAK 23

A: if the academic can determine whether the risk meets the definition of contingent liability based on probability and estimated liabilities, and can explain the principle of contingent disclosure in the notes to the financial statements, then the academic is ready.

Q4: How do long-term climate risks such as drought affect the valuation of biological assets or inventories, and can they trigger impairment testing in financial reporting reports? T: 202, 241, 236

A: if the participant can explain how climate risk impacts the fair value assessment of biological assets and inventories, and can determine when and how to conduct impairment testing according to relevant accounting standards, then the participant is considered ready.

Q5: in terms of forward-looking information, how should the company reflect the impact of drought risk on projected future earnings and fair value of assets? T: 113, 336

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A: if the academician can explain how the adjustment of income projection assumption and fair value assessment is done by considering drought risk in forwardlooking and appropriate measurement methodology, then the academician is ready

Q6: What are the challenges faced in terms of converting physical risk information such as drought into numbers or information that is accounting reliable?

T: 201, 208

A: if the researcher can identify and explain the challenges in measuring physical risk, including data uncertainty, estimation models, and methodological limitations, as well as their impact on the reliability of accounting information, then the researcher is ready.

Q7: What are the challenges faced when it comes to converting sustainability information into numbers or accounting reliable information?

T: 201, 208

A: if the participant can describe the difficulty of measuring qualitative aspects of sustainability, the complexity of the methodology, and the need for consistent measurement standards to produce reliable and relevant information, then the participant is ready.

Q8: How can regulatory risks arising from the transition to renewable energy affect a company's financial reporting and accounting treatment? (transition from fossil fuels to renewable energies-obligation to use green energy).

T: 237, 216

A: if the academic can explain the impact of the energy transition regulation on the recognition of obligations (eg green energy obligations), measurement of transition costs, and accounting implications for changes in assets and liabilities, then the academic is ready.

Q9: what is the impact of emission regulations (carbon tax, cap-and-trade, or emission limits) on the company's financial position, operating expenses, and accounting reporting?

T: 237, 201

A: if the participant can explain the recognition and measurement of carbon tax-related liabilities, recording of operating expenses incurred, and the treatment of assets in the form of emission rights or carbon credits according to accounting standards, then the participant is ready.

Q10: what are your suggestions as a financial accounting expert regarding the integration of sustainability reporting into the company's financial statements analysis: as a financial accounting expert, I suggest that the integration of Sustainability Reporting be done by developing harmonized measurement and disclosure standards between financial reporting and sustainability, strengthening information systems that support data forwardlooking, and paying attention to the principles of, and materiality so that sustainability information can provide added value and real transparency for stakeholders.

T: 201, 208

A: if the academic can provide recommendations on accounting policies and disclosure formats for the integration of sustainability reporting, then the academic is ready.

4. Questions for Public Accountants (Assurance Services)

Q1: how well do you understand IFRS S1 and IFRS S2 standards regarding sustainability and climate reporting? Q: understanding of Standards (IFRS S1, IFRS S2) A: if the respondent demonstrates an in-depth understanding of the content and requirements of IFRS S1 and S2, including the technical aspects of sustainability and climate reporting, then it can be said to be ready. Q2: does your company have sufficient resources and competencies to provide assurance services on reports prepared under IFRS S1 and S2?

T: Resources and competencies (HR, Certification, experience)

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A: if the respondent states to have a trained team, certified staff, or nonfinancial Assurance Report experience, then ready.

Q3: what assurance methods or approaches are commonly used in verifying sustainability reports, and how do you adapt them to IFRS S1 and S2?

Q: assurance methodology (standard approach, IFRS S1 & S2 adjustments) A: if there is a standard assurance method that is clear and adapted to sustainability reporting, then it indicates readiness.

Q4: what are the main challenges you face in providing assurance services for sustainability reporting, especially those that follow IFRS S1 and S2?

Q: challenges and mitigations (obstacles, solutions)

A: if the challenge is recognized and accompanied by a strategy or solution plan, then the respondent is ready.

Q5: How do you assess the readiness of the industry (client) in presenting data that can be audited and reassured according to IFRS S1 and S2 standards?

Q: Quality Of Client Data (Validity, Auditability)

A: if the respondent believes that the client's data is quite valid and can be audited even though there is still room for improvement, then it is said to be ready.

Q6: is there any training or professional development that has been or is being done to improve the capability in providing assurance services related to IFRS S1 and S2?

T: training and Competency Development (certification, collaboration)

A: if there is training, certification, or collaboration with external agencies for competency improvement, then it indicates readiness.

Q7: How do you address issues related to data forwardlooking or estimation that are an important part of IFRS S1 and S2 reporting?

T: Management Of ForwardLooking Information (Procedures, Methodologies, Tools)

A: if the respondent has procedures, methodologies, or tools to test the reliability of the estimate information, then it is ready.

Q8: do you see the need for special assurance standards that are different from traditional financial statement assurance standards? If yes, like what?

Q: Special Assurance Standards (Adaptation, Preparation)

A: if it recognizes the need for a specific standard and is already preparing to adopt it, then the respondent is ready.

Q9: How do you view the role of technology (e.g. data analytics, AI) in supporting the assurance of sustainability reporting based on IFRS S1 and S2?

Q: technology in Assurance (Data Analytics, AI)

A: if it mentions the use of advanced technology as part of the assurance process, then it indicates readiness.

Q10: what are your suggestions to improve the readiness of assurance service providers in facing the implementation of IFRS S1 and S2 in Indonesia?

T: Development Recommendation (Training, Collaboration, Information System)

A: if it gives concrete recommendations for training, collaboration and strengthening information systems, then it is ready.

Furthermore, thematic insights from interviews with companies, the Indonesian Institute of accountants (IAI), academics, and Public Accountants revealed three levels of stakeholder readiness:

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1. Initial readiness-limited awareness of IFRS S2, no formal implementation steps.

2. Simply ready-awareness of IFRS S2; early stage alignment with POJK 51 and internal ESG efforts.

3. Ready to adopt-institutions with existing ESG governance structures, policy frameworks, and training programs.

The main themes that emerged include:

1. The need for technical guides and specific templates for specific sectors;

2. Capacity building initiatives for assurance systems and data;

3. The importance of aligning PSAK and IFRS to avoid redundancy or inconsistency. These results support the feasibility of IFRS S1 and S2 adoption in Indonesia while underscoring challenges in infrastructure, expertise, and system integration.

CONCLUSION

The first part of the study resulted in the development of a proposed set of indicators based on IFRS S1 and S2 that are relevant for Sustainability Reporting in Indonesia. These indicators are systematically categorized into accounting groupings and associated with the types of transactions that occur in business operations, making it easier for companies to prepare structured and standardized sustainability disclosures. In addition, the study identifies the risks and opportunities associated with each indicator and provides practical examples of disclosure practices. The findings also show significant financial implications of sustainability issues, which are then analyzed and mapped into the applicable PSAK standards. These results provide a technical foundation for the development of practical guidelines and for assessing Indonesia's readiness to adopt IFRS S1 and S2. The second part of the study revealed that readiness to adopt IFRS S1 and S2 varied among informants, including representatives from companies, the Indonesian Institute of accountants (IAI), public accountants, and academics. Thematic analysis of in-depth interviews resulted in three categories of readiness: (1) early readiness-stakeholders at an early stage in understanding the standard; (2) adequately prepared-stakeholders with basic structural and conceptual understanding but lacking implementation capacity; (3) ready to adopt - stakeholders who are institutionally and technically ready to implement IFRS S1 and S2 in their sustainability reporting practices. and S2 in their sustainability reporting practices.

Implications, Limitations and Future Research

This research provides several important implications for practice and academic development. In practical terms, the proposed readiness indicators and frameworks can assist entities in formulating sustainability disclosure strategies that are aligned with IFRS S1 and S2. These indicators also serve as a technical guide for compiling sustainability reports that integrate financial implications, making them more relevant to investors and other stakeholders. Academically, these findings contribute to the growing literature on the integration of sustainability into corporate financial reporting, and offer a foundation for future empirical and policy-based research. From an accounting perspective, this study enhances the understanding of how sustainability-related financial disclosures can reflect underlying risks and opportunities that affect a company's Assets, Liabilities, Income, Expenses, and cash flows. In addition, this study highlights how disclosure sustainability can affect both capital expenditure (CapEx) and operational expenditure (OpEx), thus affecting financial planning and decision-making processes. Data collection was limited to interviews, so the data obtained consisted only of interview answers, with the informant providing their respective perceptions. Future research is recommended to address the limitations of this study, especially the potential impact on the depth of analysis, especially in comprehensively evaluating enterprise-level data.

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