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IMPLEMENTATION OF GREEN ACCOUNTING IN EFFORTS TO REALIZE A SUSTAINABLE GREEN ECONOMY IN BANTEN PROVINCE, INDONESIA: A CASE STUDY OF CHEMICAL COMPANIES

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Information	Abstract:
Article History: Received : 13.07.2025 Revised : 14.10.2025 Accepted : 09.12.2025 Keywords: Green Accounting, Green Economy, Corporate Sustainability, Environmental Management	This research comprehensively examines the crucial role of green accounting as a strategic instrument in driving the transition towards a sustainable green economy in Banten Province, Indonesia. By adopting a dominant qualitative approach through a multiple case study on three leading chemical companies in Banten, PT. Lotte Chemical, PT. Chandra Asri Chemical and PT. Asahimas Chemical. This study analyzes the green accounting practices implemented, the factors influencing them, and their contribution to sustainability. The findings indicate significant variations in the maturity level of green accounting implementation among these companies, which are influenced by top management commitment, government regulatory frameworks, and stakeholder pressure. Despite inherent challenges such as limited understanding, data, and clear standards, green accounting practices have been shown to substantially improve resource efficiency, reduce pollution, and enhance transparency, which are essential pillars of green economic development. This article highlights the urgency of multi-stakeholder collaboration, strengthening regulatory frameworks, and enhancing human resource capacity to accelerate the adoption and effectiveness of green accounting as a catalyst for a greener, more sustainable future.

A. INTRODUCTION

The 21st century is marked by increasing global awareness of the environmental crisis and the urgency of sustainable development. Climate change, deforestation, resource scarcity, and pollution have become real threats demanding fundamental changes in how humans interact with the environment and conduct economic activities. In this context, the concept of a green economy has emerged as a

promising development paradigm, striving to achieve human well-being and social equity, while significantly reducing environmental risks and ecological scarcity (UNEP, 2011). The transition to a green economy requires instruments and mechanisms that integrate environmental dimensions into economic decision-making, and this is where green accounting plays a crucial role.

Green accounting is an evolution of conventional accounting, systematically identifying, measuring, analyzing, and reporting the environmental impacts of an entity's economic activities. Its purpose is not merely regulatory compliance but to provide a comprehensive overview of a company's environmental and financial performance, so that the "hidden costs" of environmental degradation can be internalized and proactively managed. Thus, green accounting serves as a bridge connecting economic performance with environmental responsibility, supporting more strategic and sustainable decision-making.

Indonesia, as a developing country with rapid economic growth, faces a dilemma between economic development and environmental preservation. Banten Province, one of Indonesia's industrial and economic centers, serves as a representative arena to examine this dynamic. Rapid industrial growth in Banten, while boosting the economy, also creates significant environmental pressure. Data shows that approximately 30% of land in Banten has experienced degradation due to industrial and mining activities, indicating negative externalities that have not been fully internalized in the conventional economic system. This challenge underscores the urgency of implementing green accounting as a strategic tool to manage environmental impacts, promote resource efficiency, and accelerate the transition towards a sustainable green economy in the region.

This research specifically aims to: (1) analyze the concepts and practices of green accounting applied by companies in Banten Province; (2) identify and evaluate internal and external factors influencing the level of green accounting implementation in these companies; and (3) examine how the implementation of green accounting concretely contributes to the realization of a sustainable green economy in Banten. Through a multiple-case study of three leading chemical companies, this research is expected to provide in-depth insights and practical

recommendations for stakeholders to achieve harmonious development between the economy and the environment.

B. LITERATURE REVIEW

Concept of Green Accounting

Green accounting, or environmental accounting, is an accounting system designed to identify, measure, analyze, interpret, and communicate information regarding the environmental costs and benefits of an entity's economic activities (Schaltegger & Burritt, 2000). Unlike traditional financial accounting, which focuses solely on monetary transactions, green accounting expands its scope to include environmental impacts, both quantitative and qualitative. Its goal is to provide a more holistic and accurate picture of a company's performance, not only from a financial perspective but also from an ecological one. This concept includes three main categories of environmental costs:

Prevention Costs: Costs incurred to prevent environmental damage from occurring, such as investments in clean technology, employee training on eco-friendly practices, or designing more sustainable products.

Detection Costs: Costs incurred to monitor and measure environmental performance, such as environmental audits, water/air quality testing, or environmental reporting systems.

Failure Costs: Costs incurred due to environmental damage that has already occurred. These are further divided into:

- a. **Internal Failure Costs:** Costs incurred before a product or service reaches the customer, such as waste treatment costs, fines due to regulatory violations, or costs of repairing environmental damage within company facilities.
- b. **External Failure Costs:** Costs incurred after a product or service reaches the customer or impacts the environment outside the company's control, such as oil spill cleanup costs, compensation to affected communities, or loss of reputation.

By internalizing these costs, companies can identify areas for improvement, reduce risks, and enhance operational efficiency.

Concept of Green Economy

A green economy is an economic model that seeks to achieve sustainable development by prioritizing human well-being and social equity, while significantly reducing environmental risks and ecological scarcity (UNEP, 2011). A green economy does not only focus on GDP growth but also on the quality of that growth, ensuring that economic growth does not degrade the natural resource base that supports it. The main principles of a green economy include resource efficiency, low carbon, social inclusion, and ecological resilience. The transition to a green economy involves investing in environmentally friendly sectors, developing green technologies, creating green jobs, and shifting consumption and production patterns toward greater sustainability.

Relationship between Green Accounting and Green Economy

Green accounting serves as a fundamental tool and strategic bridge for realizing a green economy. By providing relevant and reliable information regarding environmental impacts, green accounting enables companies to:

1. **Identify Efficiency Opportunities:** Measuring energy, water, and raw material consumption helps companies find ways to reduce waste and save costs, in line with the principle of resource efficiency in a green economy.
2. **Foster Sustainable Innovation:** By understanding environmental costs and risks, companies are encouraged to invest in cleaner and more innovative technologies and production processes.
3. **Enhance Transparency and Accountability:** Comprehensive environmental reporting increases stakeholder trust and encourages companies to be responsible for their ecological impacts.
4. **Support Strategic Decision-Making:** Green accounting information helps management make better investment decisions, manage environmental risks, and identify new market opportunities in the green sector.

In short, green accounting provides the quantitative framework needed to monitor progress towards a green economy, ensuring that sustainability goals are integrated into core business strategies.

Theoretical Framework

This research is based on several relevant theories:

1. Stakeholder Theory: This theory states that the success of an organization depends not only on meeting the needs of shareholders but also on meeting the needs and expectations of various other stakeholders (Freeman, 1984). In the context of green accounting, stakeholders such as government, community, customers, investors, and NGOs have an interest in the company's environmental performance. Pressure from these groups can encourage companies to adopt green accounting practices and report their environmental performance.
2. Legitimacy Theory: This theory suggests that organizations strive to operate within the bounds and norms accepted by society (Suchman, 1995). Companies adopt green accounting practices and environmental reporting to gain or maintain their social legitimacy. By demonstrating commitment to the environment, companies can enhance public image, avoid regulatory sanctions, and attract socially responsible investments.

Institutional Theory: This theory explains how organizations adopt certain practices and structures in response to pressures from their institutional environment, including regulations, social norms, and professional expectations (DiMaggio & Powell, 1983). In the context of green accounting, government regulations (e.g., PROPER, AMDAL) and industry norms regarding sustainability can encourage companies to implement green accounting practices, even if the direct financial benefits are not yet fully clear.

C. METHODOLOGY

This research adopts a predominantly qualitative approach, using mixed methods and a multiple-case study design. The qualitative approach was chosen to gain an in-depth understanding of the complexities of green accounting implementation in the real-world context of companies in Banten, including their perceptions, motivations, and challenges. The multiple case study allows for comparisons between companies to identify common patterns and specific

differences in green accounting practices. This research was conducted in Banten Province, Indonesia, chosen because it is a strategic industrial center facing significant environmental challenges. Data collection and analysis were carried out from August to November 2025. The research population includes companies in Banten with significant environmental impacts, relevant government agencies (e.g., Banten Province Environmental Agency), and non-governmental organizations (NGOs) focused on environmental issues. The research sample was selected through purposive sampling to ensure that the chosen informants and cases were relevant and could provide rich information. Key informants include:

- a. Financial managers, sustainability managers, or environmental-related staff from three leading chemical companies: PT. Lotte Chemical, PT. Chandra Asri Chemical and PT. Asahimas Chemical. These companies were chosen due to their large-scale operations and significant potential environmental impact.
- b. Officials from the Banten Province Environmental Agency (DLH) are responsible for environmental regulation and supervision.
- c. Academics or practitioners with expertise in green accounting or sustainability.
- d. Representatives of civil society or environmental NGOs active in Banten.

For data sources, primary data: Obtained through in-depth interviews with key informants to explore their perceptions, experiences, and views on green accounting. Non-participatory observation was also conducted to directly observe environmental management practices and reporting systems in company facilities.

Secondary Data: Obtained from various sources, including company financial reports, sustainability reports, Corporate Performance Rating Program (PROPER) reports, government regulatory documents, scientific literature (journals, books, theses), as well as related news and articles. In-depth Interviews: Conducted semi-structuredly, allowing flexibility to explore topics that emerged during the interview, while still guided by a prepared list of questions. Interviews were recorded with the informant's permission and transcribed for analysis.

Non-Participatory Observation: Researchers observed operational processes, waste management facilities, and environmental policy implementation in companies without directly participating in these activities.

Documentation: Collection and analysis of relevant documents to complement and validate data obtained from interviews and observations. Data analysis techniques. Qualitative data were analyzed using the interactive model of Miles and Huberman (1994), which is a cyclical and iterative approach:

1. Data Reduction: The process of selecting, focusing, simplifying, abstracting, and transforming raw data obtained from field notes, interview transcripts, and documents. Irrelevant data will be eliminated, while important data will be synthesized.
2. Data Display: The organized and compressed presentation of information in the form of matrices, graphs, or descriptive narratives to facilitate understanding and drawing conclusions.
3. Conclusion Drawing/Verification: Drawing initial conclusions based on patterns and themes emerging from the data display. These conclusions are then verified by referring back to the original data and through an iterative process to ensure validity and reliability.

In addition, content analysis was also used to identify key themes, frequency of occurrence, and patterns in the textual data obtained.

To ensure the validity and reliability of the findings, several qualitative data validity test techniques were applied:

1. Source Triangulation: Comparing information obtained from various sources (e.g., interviews with managers, company reports, and NGO perspectives) to confirm the consistency and accuracy of the data.
2. Method Triangulation: Using various data collection methods (interviews, observation, documentation) to check whether the same findings emerge from different approaches.

- a. Member Checking: Confirming data interpretations and conclusions with key informants to ensure that their views have been accurately represented.
- b. Audit Trail: Detailed recording of all research stages, from data collection to analysis, to ensure transparency and traceability of the process.
- c. Prolonged Engagement: Conducting sufficiently long interactions with informants and research locations to build trust and gain an in-depth understanding of the context.

Discussion with Peers: Involving other researchers to provide critical input and alternative perspectives on data analysis and interpretation.

D. RESULT AND ANALYSIS

Implementation of Green Accounting in Banten Companies

The research results show that the implementation of green accounting in Banten Province is at varying stages of development, ranging from basic, reactive practices to more integrated, proactive approaches. Large and multinational companies generally exhibit higher levels of awareness, but their comprehensive understanding of all aspects of green accounting, especially indirect costs and environmental benefits, remains limited.

Identification of Environmental Costs: Most companies have successfully identified and recorded direct and mandatory environmental costs, such as waste treatment costs, payment of fines or environmental levies, licensing costs, and investments in pollution control equipment. However, the identification of indirect or hidden costs, such as material inefficiency costs, reputational costs due to environmental incidents, or opportunity costs of not adopting sustainable practices, is still rarely done systematically. This indicates that most companies still focus on regulatory compliance rather than fully integrating environmental considerations into their core business strategy. For example, PT. Asahimas Chemical tends to integrate environmental prevention costs into their Corporate Social Responsibility (CSR) program, which, although positive, does not necessarily reflect a comprehensive environmental cost-benefit analysis in financial reports.

Measurement and Reporting: Environmental performance measurement and reporting are generally carried out through monitoring emissions, energy consumption, and waste volume in accordance with government regulations, such as those stipulated in the Corporate Performance Rating Program (PROPER) by the Ministry of Environment and Forestry. This reporting is often separate from the main financial reports and is more commonly found in voluntary sustainability reports.

PT. Lotte Chemical: This company demonstrates a high and transparent level of green accounting reporting maturity. They comprehensively quantify three types of green accounting costs: prevention costs (e.g., investments in cleaner production technology), detection costs (e.g., regular air and water quality monitoring), and environmental failure costs (internal and external). In addition, PT. Lotte Chemical is active in circular programs such as "Project LOOP" aimed at reducing plastic waste and saving resources, and supports the social enterprise "Impactk" which develops plastic alternatives. This approach reflects a strong commitment to sustainability and the integration of green accounting into operational strategy.

PT. Chandra Asri Chemical: Also shows a high level of reporting maturity, especially in the recognition of costs related to greening and conservation efforts. They successfully quantify prevention costs numerically, demonstrating tangible investments in preventing environmental impacts. However, detection costs and internal failure costs are reported qualitatively, with statements such as "there is a budget stated as 'available'" without specific measurable values. The company's green investments are very prominent in the form of physical assets, such as the installation of a 4.3 MWp Solar Power Plant (PLTS), the purchase of electric buses for employee transportation, and the "Plastic Asphalt" infrastructure project which utilizes plastic waste. This demonstrates a commitment to decarbonization and the circular economy.

PT. Asahimas Chemical: This company's approach is more principled and qualitative. They do not report green accounting data separately in the categories of prevention, detection, and failure costs. Environmental costs are integrated as part of the CSR program. Its green investments focus on purchasing Renewable Energy Certificates (REC) from PLN to offset energy consumption, as well as CSR activities such as mangrove planting and coral reef rehabilitation. Although contributory, this

approach provides less clear quantitative picture of the internalization of environmental costs in core operations.

Level of Integration: The level of integration of environmental data into the company's main accounting system is still relatively low. Environmental data are often managed by the environmental or operational department and are not fully connected to the finance department for comprehensive cost-benefit analysis or to influence strategic investment decisions. This creates information silos that hinder truly integrated decision-making.

Factors Influencing Green Accounting Implementation

The implementation of green accounting in Banten is influenced by a complex interaction between internal and external factors: Internal Factors:

- a. **Top Management Commitment:** This is a key determinant. Companies with leaders who have a strong sustainability vision and view environmental issues as strategic opportunities tend to be more proactive in adopting and integrating green accounting practices. Conversely, without this commitment, implementation tends to be reactive and minimalist.
 - b. **Employee Awareness and Knowledge:** The level of employee awareness and knowledge regarding green accounting and its benefits still varies. This limited understanding becomes a barrier to accurate environmental data collection, analysis, and effective reporting. Training and capacity building are crucial.
 - c. **Resource Availability:** Adequate budget, trained human resources (environmental accountants, environmental experts), and supporting information technology infrastructure (environmental management information systems) are very important. These limitations, especially for Micro, Small, and Medium Enterprises (MSMEs), often become significant obstacles.
 - d. **Organizational Culture:** Organizational culture that is still oriented towards short-term profits and a lack of appreciation for environmental performance can hinder investment in sustainable practices, including green accounting.
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While for the external factors:

- a. Government Regulations: The Law on Environmental Protection and Management (UU PPLH) and the Corporate Performance Rating Program (PROPER) by the Ministry of Environment and Forestry are key drivers for companies to meet minimum compliance standards. Nevertheless, these regulations do not specifically mandate detailed and comprehensive green accounting reporting, so implementation is often limited to basic compliance.
- b. Stakeholder Pressure: Investors who are increasingly concerned about Environmental, Social, and Governance (ESG) aspects, environmentally conscious customers, affected local communities, and non-governmental organizations (NGOs) exert significant pressure on companies to adopt more responsible and transparent practices. This pressure can encourage companies to go beyond minimum compliance.
- c. Technological Support: Advances in information technology offer great opportunities for more efficient and accurate collection, analysis, and reporting of environmental data. However, the cost of adopting new technologies and the complexity of their integration can pose challenges, especially for companies with limited resources.
- d. Lack of Government Incentives: The lack of specific fiscal or non-fiscal incentives from the government for companies that proactively implement comprehensive green accounting is an obstacle. Incentives can include tax relief, subsidies for green investments, or ease of licensing.

Contribution of Green Accounting to Sustainable Green Economy

Although its implementation varies and still faces challenges, green accounting practices in Banten have made a tangible contribution to efforts to realize a sustainable green economy:

1. Improved Resource Efficiency: By recording and analyzing the costs of energy, water, and raw material consumption, green accounting encourages companies to identify areas of waste and seek ways to reduce waste and increase efficiency. An example is PT. Lotte Chemical's "Project
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LOOP" which focuses on waste reduction and recycling, in line with circular economy principles and resource efficiency. The operational cost savings resulting from this efficiency directly contribute to economic sustainability.

2. Pollution and Emission Reduction: Measuring and reporting greenhouse gas emissions, liquid waste, and solid waste motivates companies to invest in cleaner technologies and more environmentally friendly production processes. This contributes to reducing negative impacts on the environment, such as improving air and water quality. National targets to achieve Net-Zero Emissions by 2060 and a 30% independent emission reduction become a driver for companies to internalize emission costs and invest in low-carbon solutions.
3. Driver for Green Investment: Green accounting encourages companies to allocate budgets and invest in green initiatives. This includes environmental prevention costs (e.g., investments in cleaner production technology, as done by PT. Lotte Chemical), environmental detection costs (environmental quality testing and monitoring), and internal failure costs (substandard waste treatment, fines). Investments in physical assets such as PLTS and electric buses by PT. Chandra Asri, as well as the purchase of Renewable Energy Certificates (REC) and CSR programs by PT. Asahimas Chemical, demonstrate a commitment to green investment which is a key element of the green economy. These investments not only reduce environmental impact but can also enhance company competitiveness and reputation.

Increased Transparency and Accountability: By providing measurable, verifiable environmental information, green accounting enhances companies' transparency and accountability to stakeholders. This encourages companies to adopt more responsible and ethical business practices, build public trust, and attract sustainability-oriented investors

E. CONCLUSION

This research concludes that the implementation of green accounting in Banten Province varies in maturity across companies, significantly influenced by management commitment, government regulatory frameworks, and stakeholder pressure. Although there are challenges in understanding, data availability, and the lack of clear standards, existing green accounting practices have made a tangible contribution to efforts to realize a sustainable green economy. This contribution is manifested through improved resource efficiency, reduced pollution and emissions, and the promotion of essential green investments. Green accounting functions not only as a compliance tool but also as a strategic instrument that bridges economic performance and environmental responsibility, supporting stakeholder legitimacy and institutional theories in the context of sustainability. To accelerate the transition towards a more robust green economy, collaborative efforts from all parties are needed, supported by proactive policies and continuous capacity building.

F. REFERENCES

- Barney, J. B. (1991). *Firm Resources and Sustained Competitive Advantage*. *Journal of Management*, 17(1), 99-120.
- Bebbington, J. (2001). *Sustainable development: a review of the international development literature*. *Accounting Forum*, 25(2), 128-157.
- Bebbington, J., & Gray, R. (2001). *An account of sustainability: Failure, success and a reconceptualisation*. *Critical Perspectives on Accounting*, 12(5), 557-578.
- DiMaggio, P. J., & Powell, W. W. (1983). *The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields*. *American Sociological Review*, 48(2), 147-160.
- Donaldson, T., & Preston, L. E. (1995). *The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications*. *Academy of Management Review*, 20(1), 65-91.
- Dowling, J., & Pfeffer, J. (1975). *Organizational Legitimacy: Social Values and Organizational Behavior*. *Pacific Sociological Review*, 18(1), 122-136.
- Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Pitman.
- Gray, R. (2010). *Is accounting for sustainability possible?* In *Environmental Management Accounting for Corporate Sustainability* (pp. 3-24). Springer.
-

- Gray, R. (2010). *The status of social and environmental reporting in the UK: a review of current practice. Journal of Business Finance & Accounting*, 37(1-2), 1-28.
- Gray, R., Owen, D., & Adams, C. (1996). *Accounting & Accountability: Changes and Challenges in Corporate Social and Environmental Reporting*. Prentice Hall.
- GRI Standards.
- IFAC. (2005). *Environmental Management Accounting: An Introduction and Status Report*. IFAC.
- IIRC. (2013). *The International Framework*. IIRC.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. Sage Publications.
- OECD. (2002). *Environmental Management Accounting: Procedures and Principles*. OECD.
- OECD. (2011). *Towards Green Growth*. OECD Publishing.
- Pearce, D. W., & Turner, R. K. (1990). *Economics of Natural Resources and the Environment*. Johns Hopkins University Press.
- Peraturan Menteri Lingkungan Hidup dan Kehutanan terkait Program Penilaian Peringkat Kinerja Perusahaan dalam Pengelolaan Lingkungan Hidup (PROPER).
- SASB Standards.
- Schaltegger, S., & Burritt, R. (2000). *Contemporary Environmental Accounting: Issues, Concepts and Practice*. Greenleaf Publishing.
- Schaltegger, S., & Burritt, R. L. (2000). *Environmental management accounting: A framework for implementation. Environmental Management Accounting and Supply Chain Management*, 1(1), 1-20.
- Scott, W. R. (2001). *Institutions and Organizations*. Sage Publications.
- Suchman, M. C. (1995). *Managing Legitimacy: Strategic and Institutional Approaches. Academy of Management Review*, 20(3), 571-610.
- Undang-Undang Republik Indonesia Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup.
- UNEP. (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication – A Synthesis for Policy Makers*. UNEP.
- UNEP. (2012). *Green Economy Report: Measuring Progress Towards a Green Economy*. UNEP.
-

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United Nations. (1993). *Environmental Accounting: A Practical Guide*. UN.

World Commission on Environment and Development. (1987). *Our Common Future*.

Oxford University Press.
