Analysis of Green Accounting Implementation in Utility Companies in Indonesia (Case Study on PT Perusahaan Listrik Negara (Persero))

Endah Endah[1] and Vogy Gautama Buanaputra [2]
[1] Universitas Gadjah Mada inceton University, Special Region of Yogyakarta 55281, Indonesia
[2] Universitas Gadjah Mada inceton University, Special Region of Yogyakarta 55281, Indonesia

Abstract

This research aims to analyze the implementation of green accounting in utility companies in Indonesia, specifically through a case study of PT PLN (Persero). The objective is to enhance understanding of how utility firms can incorporate environmental considerations into their financial reporting and decision-making processes. Utilizing a qualitative case study methodology, data was collected through interviews and analyzed thematically. The findings indicate that PT PLN has successfully adopted green accounting practices, progressing through the stages of environmental awareness, involvement, and reporting. This implementation serves to uphold the company's legitimacy within society by addressing pragmatic, normative, and cognitive aspects, despite its status as a monopolistic electricity provider. PT PLN emphasizes its environmental and social responsibilities while prioritizing customer satisfaction. The implications of this study suggest that adopting green accounting can significantly enhance PT PLN's commitment to environmental issues, fostering a more sustainable strategy and improving its public image as a contributor to environmentally friendly industrial policies.

Keywords: *green accounting, utility company, PLN*

A. Arif et al. (eds.),*Proceedings of the International Conference on Multidisciplinary Studies (ICoMSi 2024)*, Advances in Social Science, Education and Humanities Research 926,
https://doi.org/10.2991/978-2-38476-406-8_14

1 Introduction

Environmental issues caused by companies have become a major concern in the last decade (Zainab & Burhany, 2020). This has made companies increasingly focus on social and environmental responsibility (Abdullah & Amiruddin, 2020). Sustainable Development Goals (SDGs) are an important reference for companies in sustainable development efforts through 17 goals that focus on the environment, social and economy. In the effort to implement SDGs, accounting plays an important role through voluntary disclosures in financial statements related to environmental costs (environmental costs or green accounting) (Gray & Bebbington, 2001; Aniela, 2012). Green accounting is a follow-up by companies from several SDGs points, such as SDG 12 (Responsible Consumption and Production) which focuses on reducing emissions and effective use of resources, and SDG 13 (Climate Action) which focuses on mitigating climate change.

The Indonesian government has regulations to regulate corporate responsibility in environmental aspects in the form of Law No. 40 of 2007 concerning Limited Liability Companies (UUPT). In addition, there is Government Regulation (PP) No.47/2012 on the Implementation of Corporate Social and Environmental Responsibility (CSR). Based on existing regulations, social and environmental responsibility is a company obligation that is carried out periodically and is accountable for its performance to stakeholders (Lako, 2015).

Legitimacy theory shows the existence of a social contract where companies are responsible for the demands of society and the environment (Deegan, 2002). One way for companies to maintain legitimacy is to carry out legitimacy communication strategies (Dowling & Pfeffer, 1975), such as environmental disclosure in the form of implementing green accounting as an effort to gain legitimacy (Gray & Bebbington, 2000). Green accounting is a system for creating costs and obtaining environmental benefits and providing information that helps managers evaluate, operate, control, decide, report, and protect the environment (Rounaghi, 2019). Green accounting research has been heavily based on legitimacy theory, and continues to be widely referenced, developed, and tested in a large number of empirical studies (Deegan & Rankin, 1996; Patten, 2002; Wiseman, 1982) to explain corporate decisions regarding environmental disclosure. Green accounting research on utility companies is necessary because of their role in providing a range of services consumed by the public such as: electricity, natural gas, water, telephone, transportation and others (Ebert & Griffin, 2015). Utility companies are expected to play a key role as climate change objectives under critical scrutiny by regulators and stakeholders (Slacik & Greiling, 2020). The implementation of green accounting is an effective strategy to reduce the negative impact of utility companies on the environment, as well as maintain the positive impact of utility companies on the environment without sacrificing financial performance (Silva-Gao, 2012).

Based on data from The International Energy Agency (IEA), Indonesia is ranked 6th globally to be the highest record by contributing energy sector emissions of 691.97 million tons of CO2 in 2022 since 1900 records. The largest contributor to Indonesia's greenhouse gas emissions in 2022 is the exploitation of fossil fuels at 21.38%, following in second place is the power generation sector, which produces 20.44% (Voaindonesia, 2023), where power plants in Indonesia are still under the control of PT PLN (Persero).

PT PLN (Persero) is a utility company that is the main provider of electricity in Indonesia and is organized as a State- Owned Enterprise (SOE). During the New Order era, SOEs implemented privatization policies towards strategic sectors, such as telecommunications, electricity, water, coal, oil mining, and others. International financial institutions such as the International Monetary Fund/IMF, the World Bank, and the Asian Development Bank suggested the privatization of the electricity sector due to the economic crisis faced by Indonesia, especially the power generation crisis being faced by PT PLN (Persero) related to the provision of electricity for the community (Haidlir et al., 2005).

PLN's journey during the New Order was inseparable from the IMF's involvement, which was related to the purchase of powerthat was not in accordance with PLN's capacity at that time due to mafia interference in the transaction. The IMF's role in asking Indonesia to carry out structural reforms, including privatization and liberalization of the energy market as a condition for providing financial assistance, caused PLN to experience losses and difficulties in meeting national energy needs. Meanwhile, the involvement of the mafia in the power purchase process by manipulating prices in order to gain more profit, disrupted PLN's ability to meet national energy needs (Haidlir et al., 2005). In this context, PLN was forced to purchase power from private producers that was cheaper, but not in line with PLN's capacity, causing PLN to suffer losses and difficulties in meeting national energy needs.

As the decades passed, PLN successfully transformed to achieve 20 gold Company Performance Assessment Program (Proper) awards in 2023 which became a historical record for PLN, organized by the Ministry of Environment and Forestry (KLHK). PLN is committed to reducing emissions through various efforts, from decarbonization, the addition of new renewable energy (EBT) based plants, to the use of co-firing technology in PLTU (CNBC, 2023). In addition, PLN carries out sustainable empowerment in accordance with SDGs and GCG, and encourages the implementation of green economy, green industry, and green technology policies. PLN makes measurable efforts to use resources efficiently (www.pln.co.id, 2022).

Therefore, it is important to implement greenaccounting so that the management of costs aimed at the environment can be presented appropriately. Bela et al., (2023) state that companies interpret green accounting as a toolto continuously improve performance in preserving the environment, thereby improvingcompany performance. Al-Dhaimesh, (2020) found that green accounting has a significant effect on the company's economic value added (EVA), but the emission variable has a negative effect on EVA in the Qatar Stock Exchange banking sector.

Chairia et al. (2022) state that green accounting is very helpful in the business evaluation process,such as analyzing waste problems. Environmental cost reports can assist stakeholders in evaluating environmental preservation and more efficient environmental management. This is supported by Trisnawati et al. (2022) that the application of green accounting affects the increase in profits, with other benefits, namely reduced insurance costs and capital costs can reduce total production costs, potentially increasing profits and increasing business continuity. Alrazi et al. (2011) examined environmental reporting in electricity companies from several countries using legitimacy theory, finding that there isa positive relationship between environmental performance and environmental reporting.In Eastern Europe, Meyer & Pac (2013) examined state-owned energy power plants, revealing that it is important to pay more attention to the environment and make efforts to reduce emissions in state-owned electricity companies. Silva-Gao (2012) provides evidence that companies with lower levels of greenhouse gas emissions are more likely to report the amount of environmental capital costs in electric utility companies in the United States. Based on the explanation above, it is very important to analyze the implementation of green accounting in utility companies, especially PT PLN (Persero) because it plays a vital role in supplying electricity and is responsible for the environmental impact of its operational activities (Afni et al., 2020).

This research can provide insight into why and how utility companies can implement green accounting in integrating environmental considerations into financial reporting for the decision-makingprocess.

2 Legitimacy Theory

Legitimacy theory, according to Suchman (1995) is a theory that explains how companies maintain survival by accepting and enabling community support. Dowling & Pfeffer (1975) revealed that legitimacy is a condition or status that exists when an entity's value system is congruent with the value system of the wider society in which the entity is located. The legitimacy community seeks to validate and evaluate the congruence between an organization's activities and its legitimacy claims in order to bring the organization closer to achieving its legitimacy claims (Scott, 1977; Scott & Meyer, 1991).

A company may draw attention to positive news or offset negative news (poor environmental performance) through positive environmental mental disclosure and mitigation efforts (Patten, 2002; Rahman et al., 1991). (Patten, 2002; Rahman et al., 2019).Referring to various legitimacy literatures, Black (2008) articulates three forms of legitimacy claims. The first is pragmatic legitimacy, where individuals or social groups feel that the organization will pursue their interests directly or indirectly. The second is normative (moral) legitimacy, where individuals or social groups view the organization's procedures and/or goals as morally appropriate. The third form of legitimacy can be cognitive-based, which is when an organization is accepted as necessary or inevitable.

In the case study of PT PLN (Persero) in this research, although cognitive legitimacy is deeply rooted and unavoidable, it requires further intervention with the consideration that PLN is the only organization that controls the electricity sector. In addition, pragmatic and normative legitimacy claims require further evaluation from stakeholders because in the real world there are many legitimacy claims. Black (2008) argues that organizations are not only passive recipients of legitimacy evaluations from their constituents, but can also play an active role in building their legitimacy claims.

2.1 Legitimacy in Green Accounting

Green accounting research has been heavily grounded in legitimacy theory and continues to be widely referenced, developed, and tested across a large number of empirical studies to explain corporate decisions regarding environmental disclosure (Deegan & Rankin, 1996; Patten, 2002; Wiseman, 1982). Suchman (1995) revealed that moral legitimacy reflects a positive normative evaluation of the organization and its activities.

Green accounting is a system for creating costs and obtaining environmental benefits and providing information that helps managers evaluate, operate, control, decide, report, and protect the environment. (Rounaghi, 2019). Green accounting activities are also described as environmental accounting by collecting, analyzing, assessing, and preparing environmental and financial data reports with the aim of reducing environmental impacts and costs. (Aniela, 2012; Cohen & Robbins, 2011; Maunder & Burritt, 1991). Gray et al. (1995) suggest that green accounting can play an important role in helping organizations develop their environmental agenda and help negotiate the meaning of the natural environment for the organization.

Jahamani (2003) revealed the stages of green accounting implementation that include three progressive levels suggested by Teoh & Thong (1984) in terms of a company's environmental responsibility, namely its attention to environmental awareness (environmental problems), environmental involvement (involvement in environmental problems), and environmental reporting (reporting on environmental problems).

Legitimacy theory emphasizes the importance of a company to have alignment with society and operate in accordance with social norms because conformity with social norms can make the company more legitimate. (Deegan, 2004). In green accounting research, legitimacy can be considered as equalizing public perceptions of companies that implement environmental accounting practices with prevailing social norms. (Chamorro Gonzalez & Herrera Mendoza, 2021). Therefore, companies that implement green accounting can gain legitimacy from society and can be accepted by the environment in which the company is located and can continue to be sustainable (Qureshi et al., 2021). (Qureshi et al., 2012). Thus, legitimacy theory plays an important role in understanding how companies can gain legitimacy from society through green accounting practices.

Research conducted by Gray et al. (1995) suggests that environmental accounting can play an important role in helping organizations develop their environmental agenda and help negotiate the meaning of the natural environment for the organization. Although conventional accounting practices have little or no positive influence on this process, Gray et al. (1995) found that environmental accounting can assist organizations in the change towards sustainability. Gray & Bebbington (2000) suggested that the development of green accounting can help organizations to develop more sustainable and socially and environmentally responsible business practices.

Based on previous research, green accouting is seen as an important instrument to gain better knowledge about the role of companies in the economy in terms of environmental safety and citizen welfare. In general, green accounting is applied by companies that already have interest and attention to environmental sustainability, ecoefficiency, ecoeffectiveness, sustainability, and apply it in strategic management directly using various marketing tools (Cohen & Robbins, 2011). (Cohen & Robbins, 2011).

Research conducted by Beer & Friend (2006) proved that disclosure of environmental costs, both internal and external, as well as allocating costs according to the type and cost drivers through structured environmental accounting can improve environmental performance. Stanojević et al. (2010) in their research on green accounting for greener energy briefly presents software that introduces green accounting principles into the investment appraisal process, with the aim of encouraging investment into renewable energy. His research found that the wider application of green accounting standards can encourage unprecedented growth in the renewable energy sector so that it will make renewable energy investment more attractive to investors.

Research conducted by Alrazi et al. (2011) examined environmental reporting in electricity companies from several countries using legitimacy theory, and found that there is a significant positive relationship between environmental performance and environmental reporting. On the other hand, Meyer & Pac (2013) (2013) examined similar issues in state-owned energy power plants in Eastern Europe and revealed that it is important to pay more attention to the environment and make efforts to reduce emissions in state-owned electricity companies. Silva-Gao (2012) provides evidence that companies may disclose environmental capital expenditures to provide information to investors about proactive environmental strategies in electric utility companies in the United States, the results show that companies with lower levels of greenhouse gas emissions are more likely to report the amount of environmental capital costs.

The implementation of green accounting has been carried out by various organizations and companies, but previous research related to the implementation of green accounting in utility companies is still very limited, especially in Indonesia, so further research to explore the implementation of green accounting in utility companies is urgent to do because it plays an important role in meeting the needs of society at large.

3 Research Methods

This research uses a case study approach at PT PLN (Persero). Case studies are more useful in answering "how" and "why" questions and are also important for understanding the deep processes that occur in a particular case (Bryman & Bell, 2011; Scapens, 1990). This aligns with the research questions raised in this study, which seeks to explain why and how green accounting is implemented. This research collects data through semi-structured interviews. For secondary data, the author reviews documents containing information about the implementation and reporting of green accounting such as annual reports, financial reports, sustainability reports, and several other documents.

In this study, a total of twelve respondents were interviewed, all of whom occupy positions pertinent to strategic decision-making. The respondent comprised an Executive Vice President, four Vice Presidents, and seven Division Managers. This diversity of roles within the sample offers a broad spectrum of perspectives, effectively capturing both high-level strategic vision and operational considerations. Furthermore, the relevance of these positions is critical for assessing representativeness within the context of the industry or organization under study, as the prevalence of such roles can significantly enhance the generalizability of the findings.

In addition, the author explores information related to green accounting through literature studies from articles, books, and the PT PLN (Persero) website. This research data was tested with validity and reliability to maintain the quality of the data obtained and then analyzed using thematic analysis techniques, which is the process of identifying, analyzing, and reporting the patterns contained in qualitative data, then presenting it in detail and completely (Braun & Clarke, 2006).

4 Results and Discussion

4.1 Why Green Accounting is Implemented in Utility Companies in Indonesia

Jahamani (2003) emphasizes the importance of integrating environmental aspects in the accounting process to increase transparency and corporate responsibility for the environment. Legitimacy theory Black (2008) explains that companies use various strategies to gain legitimacy from all stakeholders. These strategies include transparent reporting, involvement in social activities, and disclosure of appropriate information. In this effort, PLN has made several efforts in engaging in environmental and social activities, as well as voluntarily disclosing and reporting related matters.

PT PLN (Persero) already has an awareness of the importance of the environment.This result is shown by the existence of bulletins, workshops, and competitions in each division regarding the environment in the internal company, as well as by involving stakeholders to take part in the development of EBT in the external company. PLN's involvement in efforts to deal with environmental problems that are part of the implementation of green accounting such as making energy transitions, handling environmental problems through carbon trading and renewable energy certificates, replacing plants that use fossils, coal and diesel to switch to plants with EBT. In addition, PLN also formed special divisions such as the ESG, SR (sustainability reporting), and TEK (energy transition and sustainability) divisions that focus more on managing environmental issues. As a proof of green accounting implementation, PLN has also conducted reportingrelated to various efforts made by the company for the environment and society in the form of ESG, SR, and TJSL reporting. In 2024, PLN will begin shadowing environmentalreporting in accordance with the recently issued IFRS S1 and S2. Thus, the implementation of green accounting can be considered as a way for companies to gain legitimacy from various parties, including the community, government, and environmental organizations.

The implementation of green accounting by PLN is important because it helps companies improve their social responsibility and transparency, which is very important to maintain legitimacy in the eyes of the public and other stakeholders. As the only electricity provider in Indonesia, PLN must be able to play a role in handling environmental issues. In addition, the implementation of green accounting allows PLN to create a better strategy in dealing with environmental issues, which is very relevant inthe context of PLN, which is engaged in the energy sector where the sector is one of the largest carbon emitters. Green accounting also helps companies create a better image in the eyes of the community that can support the sustainability of the company and make it easier to obtain capital from various parties such as green programs funded with green funding. By identifying, measuring, and disclosing the indirect costs and benefits of corporate activities that impact the environment, green accounting helps companies to reduce negative impacts on the environment. Green accounting ensures that companies present relevant, reliable, transparent, and comparable information, which is critical to maintaining legitimacy in the eyes of the public. By implementing green accounting, PLN can maintain its legitimacy by demonstrating a serious commitment to environmental and social responsibility, which is crucial in a business context that is increasingly focused on sustainability.

The implementation of green accounting at PT PLN (Persero) aims to address social environmental issues that have an impact on sustainable development in any country and influence corporate behavior in dealing with issues of social and environmental responsibility. The main objective of green accounting is to provide information about the company's operational performance based on protection and concern for the environment, as well as determining the environmental costs associated with the company's activities. In addition, the implementation of green accounting aims to increase the company's awareness and involvement in environmental issues, as well as increase transparency and accountability in reporting costs and various environmental activities carried out by the company.

4.2 How to Implement Green Accounting in Utility Companies in Indonesia

Legitimacy theory asserts that companies continue to strive to ensure that operational activities run within the framework of norms that apply in the environment where the company is located, and ensure that company activities are accepted by outsiders as legitimate. (Deegan, 2004). PT PLN (Persero) as a company that controls the electricity industry market in Indonesia has an awareness that its obligation is not only to provide electricity services which are public utility products, but also has an obligation to maintain environmental conditions and the social community where the company is located so that the company remains well received.

Based on the form of legitimacy claims put forward by Black (2008). The first is pragmatic legitimacy, which means that individuals or social groups feel that the organization will pursue their interests directly or indirectly. In the implementation of green accounting in PLN, pragmatic legitimacy carried out by PLN is illustrated in the form of programs carried out by PLN in an effort to deal with environmental problems. Directly it becomes the company's interest as a form of responsibility for its concern for the community and the environment in which the company's operations run. Indirectly, it becomes the company's long-term goal in shifting fossil energy, coal that causes pollution towards new renewable energy that is more environmentally friendly, and contributes to the SDGs goals to jointly protect the environment.

In addition, there is normative (moral) legitimacy, where individuals or social groups view organizational procedures and/or goals as morally appropriate. In implementing green accounting, PLN with its vision to become the leading electricity company in Southeast Asia and the customer's choice for energy solutions, makes various efforts such as waste management, reducing pollutants in operations so as not to damage the environment and disrupt community conditions. The implementation of TJSL by PLN is one of the programs that has a good impact on the community. The shift to the use of EBT is also a manifestation that PLN is trying to provide the best service so that the community's need for electricity is met without sacrificing environmental interests.

In cognitive-based legitimacy, when an organization is accepted as necessary or inevitable. PLN, which is a state-owned company as the only utility company that provides electricity in Indonesia, will always be considered necessary, important, and unavoidable. The need for electricity, which has become a basic need of today's society, makes the community or stakeholders accept the existence of PLN. Although the existence of PLN is monopolistic as the only electricity company in Indonesia, this is one of the government's policies to maintain and control that people's needs for electricity can be met properly.

The PLN 2023 consumer survey by Bank Indonesia indicated that consumer confidence increased towards Indonesia's economic conditions, with the acquisition of the Consumer Confidence Index (CCI) of 123.8, or slightly higher than the previous month of 123.6. The increase in consumer confidence in the final position of 2023 was supported by the strengthening of the Current Economic Conditions Index (CCI). (PLN, 2023). PLN as an electricity monopoly company has a greater responsibility in maintaining its legitimacy. Customer satisfaction is a reflection that the community believes that the company's operations are run properly. Activities that are not transparent or not in accordance with prevailing values can threaten legitimacy so that consumer satisfaction and confidence must be prioritized.

Legitimacy theory states that companieshave a contract with society to conduct activities in accordance with the values of justiceand how companies respond to various interest groups to legitimize the company's actions. This ensures that the company operates in a balanced manner and does not violatesocietal norms (Suchman, 1995). (Suchman, 1995). In maintaining cognitive legitimacy, companies can build communication relationships between organizations and their socialenvironment, one of which is through the application of green accounting. The implementation of green accounting by PLN is one of the company's tools or strategies in communicating its environmental performance to stakeholders. This can increase public trust in the company's operations which are seen as responsible so that it helps thecompany maintain its legitimacy.

The implementation of green accounting can improve the company's environmental performance which in turn can improve financial performance. This needs to be done because companies can identify and reduce environmental costs and improve environmental quality. (Hamidi, 2019). Green accounting is also a form of corporate social responsibility. Companies can carry out activities such as environmental cleanup, health education, etc., which can improve the company's social image and strengthen its social responsibility. (Arjuni et al., 2020).

In implementing green accounting, according to Jahamani (2003). There are three progressive stages related to corporate environmental responsibility, including environmental awareness, which is defined as the company's attention to environmental issues, environmental involvement, which is the company's involvement in environmental issues, and environmental reporting, which is the reporting of environmental issues that have been carried out by the company. Based on the interview data obtained, each subtheme related to green accounting will be explained as follows.

Environmental Awareness

One of the first stages of green accounting implementation is environmental awareness, which is defined as the awareness, concern, and attention that the company has to environmental issues. The results of the interview analysis show that PLN as a utility company that monopolizes the electricity industry in Indonesia has a high level of concern and awareness of the importance of the environment. This awareness and concern for the environment is instilled in all internal layers of the company with various supporting programs, such as bulletins, workshops, and competitions in each division.

Apart from the internal side of the company, environmental concerns carried out by PLN are ESG reporting and also climate risk reporting. PLN realizes that environmental issues are a corporate obligation so that it makes this a corporate goal that must be prioritized. As a utility company whose role is to meet the electricity needs of the entire community, PLN is not only oriented towards meeting the need for electricity. PLN also has an orientation to fulfill SDGs (sustainable development goals) such as clean and affordable energy and climate action.

It is expected that PLN will have a positive effect on the community through the implementation of TJSL. PLN will get full support from the community, and the community will be able to feel PLN's concern in the midst of its social environment. The awareness of the importance of handling environmental problems is also shownby PLN through the energy transition carried out which focuses on EBT (new renewableenergy) and begins to switch to non-fossil energy such as biomass and biodiesel. PLN also invites its stakeholders to raise awareness of environmental issues.

Awareness of the importance of handling environmental problems owned by companies must be encouraged by the integration of environmental policies. This is in line with the contextual view conveyed by Yakhou & Dorweiler (2004) regarding the need for integration of environmental policies with business policies and the role of accounting in supporting corporate environmental strategies and corporate business strategies related to environmental issues.

Environmental Involvement

The second stage of green accounting implementation, namely environmental involvement, is an action or effort taken by the company to be involved in handling environmental problems, either directly or indirectly. In the involvement of handling environmental issues, PLN has made various efforts either directly through various programs and activities carried out, or indirectly through programs, policies, and others. PLN has a vision, one of which is to make an energy transition. PLN's involvement in addressing environmental issues is also carried out through carbon trading, renewable energy certificates, and various efforts to reduce pollution caused by PLN operations such as the use of tools to reduce air and water pollution by power plants. Climate change management carried out by PLN leads to energy transition which is budgeted annually and becomes a long-term goal in replacing plants that use fossil fuels, coal, and diesel to switch to plants with renewable energy.

PLN's renewable energy completion target in 2024 reached 16% of capacity, and is targeted to reach 75% by 2040. In the green strategic goal, PLN has realized the transformation aspiration of developing EBT power plant capacity to reach 8.8 GW from the target of 18 GW in 2025 or 12.04% of the total generating capacity in the PLN system. This is supported by the increased operation of 28 new EBT plants, with an installed capacity of 4,210 MW of new renewable energy electricity (hydropower, PLTM, PLTMH, PLTP, PLTS, PLTB, PLTBM) in 2023. (PLN, 2023). Total KWh production of new renewable energy electricity in 2023 amounted to 17,921.62 GWh or reached 12.06% of total electricity production in 2023. In 2023 PLN achieved a customer satisfaction index of 98.02%, an increase from 2022 which amounted to 97.41%.

PLN's programs have focused on the green program, which focuses on the development of power plants that use new renewable energy such as hydropower, solar power, and PLTP, supported by special financing called green funding. PLN is also switching to various energy pollutants such as biomass, biodiesel, biothermal, hydrogen, and others.

PLN has also established special divisions that manage the environment in general, such as the ESG division, SR (sustainability reporting), and TEK (energy transition and sustainability) which are more focused on environmental issues. The company takes part in saving and managing the environment well so that it is not polluted from various company operational activities. The use of renewable energy plants also continues to be gradually carried out, as well as retiring power plants that use fossil materials and coal. PLN has invested in renewable energy, and started to participate in the implementation of IFRS S1 and S2, which are global sustainability reporting standards issued by the International Sustainability Standards Board (ISSB). They are designed to provide a uniform and global basis for reporting environmental, social, and governance-related information, and meet the needs of investors. This can support the sustainable linked loan for PLN.

Research Meyer & Pac (2013) which compares private and state-owned utilities in the European Union states that state-owned power plants produce greater emissions than private ones and are less involved in efforts to reduce emissions. This is different from PLN with the same position, namely as a state-owned power plant, which continues to reduce emissions produced with various programs and strategies. This is one of the ways PLN maintains its legitimacy. As the only utility company providing electricity in Indonesia, PLN has a big responsibility in its involvement in managing environmental issues so as not to violate the norms and values that exist in the community, and fulfill its obligations to stakeholders in ensuring business continuity.

PLN's involvement in environmental issues is inseparable from the existence of applicable government regulations and policies, one of which is Ministerial Regulation No. 2 of 2024 concerning Rooftop Solar Power Plants connected to the electricity network of holders of electricity supply business licenses for the public interest issued by the Ministry of Energy and Mineral Resources (ESDM). However, it is not free from negative criticism, among others, related to the elimination of the net-metering scheme, which is considered unfavorable to household customers and small businesses. Net-metering helps improve the economic viability of rooftop solar systems by accounting for excess electrical energy as a reduction in electricity bills. While rooftop PV is effective in encouraging renewable energy investment, an ongoing evaluation of this regulation is needed to determine its effectiveness in encouraging the utilization of new renewable energy (NRE). IESR considers that the elimination of net-metering will make it difficult to achieve the 23% renewable energy target by 2025. In addition, the investment cost per unit kilowatt-peak of rooftop solar power plant is higher without net-metering and the cost of batteries is still relatively expensive. This can reduce the economics of rooftop solar systems, especially in the household segment which generally experiences peak loads at night. This regulation aims to improve the governance of environmentally friendly solar energy utilization on rooftop solar power plants that are used for their own purposes. However, it should be noted that high investment costs and unfavorable returns may hinder the use of rooftop solar power systems by the public.

PLN has made various efforts related to its involvement in dealing with environmental issues such as the transition to using EBT. In line with what was stated by Stanojević et al. (2010), the first step towards the widespread use of renewable energy sources and environmental preservation is to adopt green accounting. In addition,wider adoption of green accounting standards will encourage unprecedented growth in the renewable energy sector as this will make renewable energy investments attractive to investors.

Environmental Reporting

The third implementation of green accounting is characterized by the existence of reporting by companies related to handling and efforts on environmental issues or can be referred to as environmental reporting. As part of a state-owned enterprise and the main utility company providing electricity services, PLN has conducted various reports on activities, programs, and efforts made in handling environmental issues. The report is in the form of ESG reporting, TJSL, and also SR (sustainability reporting).

With the issuance of IFRS S1 and S2, PLN has new reporting responsibilities that must follow these provisions. IFRS S1 focuses on general disclosures of financial information related to sustainability. The objective is to provide general-purpose users of financial statements with useful information for decision-making regarding the provision of resources to the company. IFRS S1 requires companies to disclose information about sustainability-related risks and opportunities that may affect their cash flow, access to finance or cost of capital in the short, medium or long term.

Meanwhile, IFRS S2 focuses on climate change-related disclosures. IFRS S2 requires companies to disclose information on governance, strategy, and risk management, as well as metrics and targets, on climate change-related risks and opportunities. Climate-related opportunities refer to potential positive impacts arising from climate change for companies, such as opportunities to develop new products or capture new business.

Although IFSR S1 and S2 have not been published for a long time, the briefing provided by IAI (Indonesian Accountants Association) and by using the services of a consultant is a provision for PLN to start implementing and reporting in accordance with these regulations or can be called shadowing. With the leading steps taken by PLN through the help of consultants in preparing the appropriate framework, this encourages PLN to report on better environmental issues so that it can meet stakeholder expectations for the environmental performance that has been carried out by PLN so that information related to energy transition efforts made by PLN as a form of concern and involvement in dealing with environmental problems can be conveyed properly to stakeholders.

In addition to ESG reporting, PLN also reports on its efforts in environmental issues in the sustainability report or SR. In the report, the company tries to report information related to environmental aspects such as greenhouse gas emissions, non-GHG emissions (greenhouse gases), related to water, air, waste management, and others.

Reporting related to environmental information that has been carried out by PLN through SR and TJSL can describe environmental performance in a positive direction. This is supported by the findings of Alrazi et al. (2011) which shows that there is a significant positive relationship between environmental performance and environmental reporting carried out by the company. Silva-Gao (2012) also revealed that companies with superior environmental performance use disclosure to communicate their superior performance to investors. In addition, companies disclose environmental information to legitimize regulatory and compliance issues.

The discussion on how the implementation of green accounting in utility companies in Indonesia with a case study on PT PLN (Persero) is as follows. In implementing green accounting, PT PLN (Persero) already has a high awareness of the importance of the environment. This is indicated by various efforts that have been made by PLN both internally to the company such as bulletins, workshops, and competitions in each division regarding the environment, as well as externally by involving stakeholders to take part in the development of EBT. PLN's involvement in efforts to deal with environmental problems is part of the implementation of green accounting such as making energy transitions, handling environmental problems through carbon trading and renewable energy certificates, replacing plants that use fossils, coal and diesel to switch to plants with EBT. In addition, PLN also formed special divisions such as the ESG, SR (sustainability reporting), and TEK (energy transition and sustainability) divisions that focus more on managing environmental issues.

As a form of green accounting implementation, PLN has also conducted reporting related to various efforts made by thecompany for the environment and society in the form of ESG, SR, and TJSL reporting. The implementation of green accounting by companies start from awareness of environmental issues and must be reflected in involvement and reporting related to environmental issues (Jahamani, 2003). This is a strategy carried out by PLN in maintaining its legitimacy in the community in the form of information transparency through reporting on environmental activities that have been carried out.

This table provides a comprehensive overview of the indicators related to the implementation of green accounting at PT PLN (Persero), highlighting current statuses and future goals aimed at enhancing environmental performance and corporate responsibility.

Tabel.1 Sumary of the Result

Indicator	Description	Current Status	Future Goals
Environmental Awareness	Company's recognition and concern for environmental issues.	High awareness through workshops and bulletins.	Continuous internal engagement and community awareness programs
Environmental Involvement	Actions taken to address environmental issues, including renewable energy initiatives.	Targeting 16% renewable energy capacity by 2024.	Achieve 75% renewable energy capacity by 2040.
Carbon Trading Initiatives	Participation in carbon trading schemes to offset emissions.	Active involvement in carbon trading.	Expand participation and effectiveness of carbon trading strategies.
Sustainability Reporting	Reporting on environmental, social, and governance (ESG) impacts.	Conducting ESG and climate risk reporting.	Align with IFRS S1 and S2 standards for enhanced transparency by 2024.
Renewable Energy Production	Total production from renewable sources as a percentage of total electricity production.	12.06% of total electricity production in 2023.	Increase to targeted levels as per future renewable energy goals.

5. Conclusion

The research focused on the implementation of green accounting at PT PLN (Persero), a utility company in Indonesia. It revealed that PLN has progressed through stages of environmental awareness, involvement, and reporting, aligning its operations with sustainability goals and addressing pollution while transitioning to renewable energy. PLN's initiatives, including waste management and Corporate Social Responsibility (CSR) programs, demonstrate its commitment to environmental accountability and social welfare, reflecting its moral legitimacy despite being a monopolistic electricity provider. The study suggests that to further enhance its green accounting practices, PLN should integrate financial and environmental reporting to improve transparency and performance, thereby fostering public trust and reinforcing its reputation as a socially responsible entity.

References

1. Abdel-Rahim, H. Y. M., & Abdel-Rahim, Y. M. (2010). Green accounting – a proposition for EA / ER conceptual implementation methodology. Journal of Sustainability and Green Business, 1–18.
2. Abdullah, M. W., & Amiruddin, H. (2020). Efek Green Accounting Terhadap Material Flow Cost Accounting Dalam Meningkatkan Keberlangsungan Perusahaan. EKUITAS (Jurnal Ekonomi Dan Keuangan), 4(2), 166–186. https://doi.org/10.24034/j25485024.y2020.v4.i2.4145
3. Abdullah, M. W., Muchlis, S., & Sari, S. N. (2015). Pengaruh Tekanan Stakeholders dan Tanggung Jawab Sosial terhadap Penerapan Akuntansi Lingkungan di Kawasan Industri Makassar. Jurnal Assets, 5(1), 105–114.
4. Abdullah, M. W., & Sari, S. N. (2015). Pengaruh Tekanan Stakeholders dan Tanggung Jawab Sosial terhadap Penerapan Akuntansi Lingkungan di Kawasan Industri Makassar. Assets, 5(1), 105–114.
5. Afni, Z., Meuthia, R., Zahara, Z., & Rahmayani, R. (2020). Judging the implementation of Green Accounting: Case study at PT. PLN (Persero) UPK Bukittinggi. https://doi.org/10.4108/eai.1-11-2019.2294002
6. Akumfi, C. A. (2022). Green Accounting Practices Lessons From an Emerging Economy; a Case Study of Listed Limited Liability Companies in Ashanti …. August. https://www.researchgate.net/profile/Christopher-Ameyaw-Akumfi-3/publication/362680867_GREEN_ACCOUNTING_PRACTICES_LESSONS_FROM_AN_EMERGING_ECONOMY_A_CASE_STUDY_OF_LISTED_LIMITED_LIABILITY_COMPANIES_IN_ASHANTI_REGION/links/62f80f74c6f6732999cbc982/GREEN-AC
7. Al-Dhaimesh, O. H. (2020). Green accounting practices and economic value added: An applied study on companies listed on the Qatar stock exchange. International Journal of Energy Economics and Policy, 10(6), 164–168. https://doi.org/10.32479/ijeep.10199
8. Alrazi, B., Villiers, C. de, & Staden, C. van. (2011). the Environmental Reporting of Electric Utilities: an International Comparison. 9th CSEAR Australasian Conference, Albury Wodonga, Australia, May 2014.

9. Anggraeni, A. A., & Dewi, H. P. (2022). Green Accounting and Corporate Social Responsibility Disclosure: Financial Performance of Mining Companies in Indonesia. Journal of Auditing, Finance, and Forensic Accounting, 10(1), 61–74. https://doi.org/10.21107/jaffa.v10i1.14034
10. Aniela, Y. (2012). Peran Akuntansi Lingkungan Dalam Meningkatkan KinerjaLingkungan Dan Kinerja Keuangan Perusahaan. Berkala Ilmiah Mahasiswa Akuntansi, 1(1), 15–19.
11. Arjuni, A., Alimuddin, Habbe, H., Mediaty, & Maulana, A. (2020). Green Accounting and Its Implementation in Indonesia. Efektor, 7(1), 59–72. https://doi.org/10.29407/e.v7i1.14414
12. Baxter, J., & Chua, W. F. (2008). The field researcher as author-writer. Qualitative Research in Accounting and Management, 5(2), 101–121.
13. Beer, P. De, & Friend, F. (2006). Environmental accounting: A management tool for enhancing corporate environmental and economic performance. Ecological Economics, 58(3), 548–560. https://doi.org/10.1016/j.ecolecon.2005.07.026
14. Bela, K., Said, D., & Rasyid, S. (2023). Green Accounting: Reality and Disclosure (Studies In The Forestry Industry In South Papua). Management Studies and Entrepreneurship Journal, 4(4), 3198–3205. http://journal.yrpipku.com/index.php/msej
15. Bewley, K., & Li, Y. (2000). Disclosure of environmental information by Canadian manufacturing companies: A voluntary disclosure perspective. Advances in Environmental Accounting and Management, 1, 26–45.
16. Black, J. (2008). Constructing and contesting legitimacy and accountability in polycentric regulatory regimes. Regulation & Governance, 2(2), 137–164. https://doi.org/10.1111/j.1748-5991.2008.00034.x
17. Braun, V., & Clarke, V. (2006). Qualitative Research in Psychology Using Thematic Analysis in Psychology Using Thematic Analysis in Psychology. Qualitative Research in Psychology, 3(2), 77–101.
18. Brooks, C., & Schopohl, L. (2021). Green accounting and finance: Advancing research on environmental disclosure, value impacts and management control systems. British Accounting Review, 53(1). https://doi.org/10.1016/j.bar.2020.100973
19. Bryman, A., & Bell, E. (2011). Business Research Methods (3rd ed). OUP Oxford.
20. Burhany, D. I. (2014). Pengaruh Implementasi Akuntansi Lingkungan terhadap Kinerja Lingkungan dan Pengungkapan Informasi Lingkungan. Proceedings SNEB, 1–8.
21. Chairia, C., Br Ginting, J. V., Ramles, P., & Ginting, F. (2022). Implementasi Green Accounting (Akuntansi Lingkungan) Di Indonesia: Studi Literatur. Financial: Jurnal Akuntansi, 8(1), 40–49. https://doi.org/10.37403/financial.v8i1.368
22. Chamorro Gonzalez, C., & Herrera Mendoza, K. (2021). Green accounting in Colombia: a case study of the mining sector. Environment, Development and Sustainability, 23(4), 6453–6465. https://doi.org/10.1007/s10668-020-00880-1
23. CNBC, I. (2023). Top! PLN Pecah Rekor Borong 20 Proper Emas KLHK 2023. CNBC Indonesia. https://www.cnbcindonesia.com/news/20231221084648-4-499125/top-pln-pecah-rekor-borong-20-proper-emas-klhk-2023
24. Cohen, N., & Robbins, P. (2011). Green Cities: An A-to-Z Guide. Green Cities: An A-to-Z Guide, 349–353. https://doi.org/10.4135/9781412973816

25. Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures–A theoretical foundation. Accounting, Auditing & Accountability Journal, 15(3), 282–311. https://doi.org/10.1108/09513570210435852
26. Deegan, C. (2004). Environmental disclosures and share prices - A discussion about efforts to study this relationship. Accounting Forum, 28(1), 87–97. https://doi.org/10.1016/j.accfor.2004.04.007
27. Deegan, C., & Rankin, M. (1996). Do Australian companies report environmental news objectively? An analysis of environmental disclosures by firms prosecuted successfully the Environmental Protection Authority. Accounting, Auditing and Accountability Journal, 9(2), 50–67.
28. Dhar, B. K., Sarkar, S. M., & Ayittey, F. K. (2022). Impact of social responsibility disclosure between implementation of green accounting and sustainable development: A study on heavily polluting companies in Bangladesh. Corporate Social Responsibility and Environmental Management, 29(1), 71–78. https://doi.org/10.1002/csr.2174
29. Dowling, J., & Pfeffer, J. (1975). Organizational Legitimacy: Social Values And Organizational Behavior. Pacific Sociological Journal Review, 18, 122–136.
30. Ebert, R. J., & Griffin, R. W. (2015). Pengantar Bisnis (A. Maulana (ed.); Sepuluh). Erlangga, PT. Gelora Aksara Pratama. https://books.google.co.id/books?id=rSz8sgEACAAJ&dq=buku+pengantar+bisnis+griffin+edisi+8+citation&hl=en&newbks=1&newbks_redir=1&sa=X&ved=2ahUKEwj0086bg_CBAxVMV2wGHeyOCZMQ6AF6BAgFEAI
31. Elizabeth, C. (2018). Analisis Pengaruh Inflasi, Nilai Tukar, Suku Bunga dan Ukuran Perusahaan terhadap Harga Saham Perusahaan Infrastruktrur, Utilitas, dan Transportasi di Indonesia. Jurnal Universitas Internasional Batam, 1(1).
32. Gray, R., & Bebbington, J. (2000). Environmental accounting, managerialism and sustainability: is the planet safe in the hands of business and accounting? Advances in Environmental Accounting and Management, 1(1), 1–44.
33. Gray, R., & Bebbington, J. (2001). Accounting for the Environment (Second Edi). Sage Publishing Ltd.
34. Gray, R., & Laughlin, R. (2012). It was 20 years ago today: Sgt Pepper, Accounting, Auditing &Accountability Journal, green accounting and the Blue Meanies. Accounting, Auditing and Accountability Journal, 25(2), 228–255. https://doi.org/10.1108/09513571211198755
35. Gray, R., Walters, D., Bebbington, J., & Thompson, I. (1995). The greening of enterprise: An exploration of the (NON) role of environmental accounting and environmental accountants in organizational change. Critical Perspectives on Accounting, 6(3), 211–239. https://doi.org/10.1006/cpac.1995.1021
36. Greenham, T. (2010). Green accounting: A conceptual framework. International Journal of Green Economics, 4(4), 333–345. https://doi.org/10.1504/IJGE.2010.037655
37. Haidlir, B. M., Tumiwa, F., & Prasetyo, E. (2005). Ketenagalistrikan Pasca Putusan MK. Jurnal Konstitusi, 1(3).
38. Hamidi, H. (2019). ANALISIS PENERAPAN GREEN ACCOUNTING TERHADAP KINERJA KEUANGAN PERUSAHAAN. Encyclopedia of Corporate Social Responsibility, 6(2). https://doi.org/10.1007/978-3-642-28036-8_100807

39. Idris. (2012). Akuntansi lingkungan sebagai instrumen pengungkapan tanggung jawab perusahaan terhadap lingkungan di era green market. Improving Performance by Improving Environment.
40. Jahamani, Y. F. (2003). Green Accounting in Developing Countries: The Case of U.A.E and Jordan. Managerial Finance, 29(8), 37–45. https://doi.org/DOI:10.1108/03074350310768418
41. Kallio, H., Pietilä, A., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. Journal of Advanced Nursing, 72(12), 2954–2965. https://doi.org/10.1111/jan.13031
42. Kumar., N. A., Pranitha., T. S., & Kumar, N. K. (1981). A Study on Green Accounting and Its Practices in India. IOSR Journal of Business and Management, 30–34. www.iosrjournals.org
43. Lako, A. (2015). Green Economy: Menghijaukan Ekonomi, Bisnis & Akuntansi. Erlangga.
44. Lewis, S. (2015). Qualitative inquiry and research design: choosing among five approaches. Health Promotion Practice, 16(4), 473–475. https://doi.org/10.1177/1524839915580941
45. Li, D., Huang, M., Ren, S., Chen, X., & Ning, L. (2018). Environmental legitimacy, green innovation, and corporate carbon disclosure: Evidence from CDP China 100. Journal of Business Ethics, 4(150), 1089–1104.
46. Maama, H., & Appiah, K. O. (2019). Green accounting practices: lesson from an emerging economy. Qualitative Research in Financial Markets, 11(4), 456–478. https://doi.org/10.1108/QRFM-02-2017-0013
47. Maunder, K. T., & Burritt, R. . (1991). Accounting and Ecological Crisis. Accounting, Auditing, & Accountability Journal, 4(3), 9–26.
48. Menon, V., Varadharajan, N., Bascarane, S., Subramanian, K., Mukherjee, M. P., & Kattimani, S. (2020). Psychological autopsy: overview of indian evidence, best practice elements, and a semi-structured interview guide. Indian Journal of Psychiatry, 62(6), 631.
49. Meyer, A., & Pac, G. (2013). Environmental performance of state-owned and privatized eastern European energy utilities. Energy Economics, 36, 205–214. https://doi.org/10.1016/j.eneco.2012.08.019
50. Morrow, S. L. (2005). Quality and Trustworthiness in Qualitative Research in Counseling Psychology. Journal of Counseling Psychology, 2(52), 250–260.
51. O'Donovan, G. (2002). Environmental Disclosure in the Annual Report: Extending the Applicability and Predictive Power of Legitimacy Theory. Accounting, Auditing and Accountability Journal, 15(3), 344–371.
52. Panggabean, R. R., & Deviarti, H. (2012). Evaluasi pengungkapan Akuntansi Lingkungan dalam Perspektif PT Timah (Persero) Tbk. Binus Business Review, 3(2), 1010–1028.
53. Patten, D. M. (2002). The relation between environmental performance and environmental disclosure: a research note. Accounting, Organizations and Society, 27(8), 763–773.
54. PLN. (2023). Annual Report PT PLN Persero 2023.
55. Qureshi, N. Z., Kulshrestha, D., & Tiwari, S. B. (2012). Environmental accounting: An essential component of business strategy. Asian Journal of Research in Banking and Finance, 2(4). https://doi.org/10.1002/bse.395

56. Rahman, M. A., Sumarlin, S., & Mus, S. F. (2019). Green Accounting Concept Based on University Social Responsibility as A Form of University Environmental Awareness. Integrated Journal of Business and Economics, 3(2), 164. https://doi.org/10.33019/ijbe.v3i2.156.
57. Rakhiemah, A. N., & Agustia, D. (2009). Pengaruh Kinerja Lingkungan Terhadap Corporate Social Responsibility (CSR) Disclosure dan Kinerja Finansial (Studi Empiris Pada Perusahaan Manufaktur Yang Terdaftar Di Bursa Efek Indonesia). Universitas Airlangga.
58. Rounaghi, M. M. (2019). Economic analysis of using green accounting and environmental accounting to identify environmental costs and sustainability indicators. International Journal of Ethics and Systems, 35(4), 504–512. https://doi.org/10.1108/IJOES-03-2019-0056
59. Salim, M. J. M., Eksandy, A., & Sofia, I. P. (2023). the Effect of Green Accounting and Firm Size on Financial Report Performance (Empirical Study of Mining Sector …. International Journal of Accounting, Management …, 1(4), 432–441.
60. Scapens, R. W. (1990). Researching management accounting practice: the role of case study methods. The British Accounting Review, 22(3), 259-281.
61. Silva-Gao, L. (2012). The Disclosure of Environmental Capital Expenditures: Evidence from the Electric Utility Sector in the USA. Corporate Social Responsibility and Environmental Management, 19(4), 240–252. https://doi.org/10.1002/csr.277
62. Silverman, D. (2010). Doing Qualitative Research. SAGE Publications.
63. Simanjuntak, U. (2022). C20 Desak Perusahaan Utilitas Segera Lakukan Transisi Energi. Institute for Essential Services Reform (IESR). https://iesr.or.id/c20-desak-perusahaan-utilitas-segera-lakukan-transisi-energi
64. Slacik, J., & Greiling, D. (2020). Coverage of G4-indicators in GRI-sustainability reports by electric utilities. Journal of Public Budgeting, Accounting and Financial Management, 32(3), 359–378. https://doi.org/10.1108/JPBAFM-06-2019-0100
65. Stanojević, M., Vranes, S., & Gökalp, I. (2010). Green accounting for greener energy. Renewable and Sustainable Energy Reviews, 14(9), 2473. https://doi.org/10.1016/j.rser.2010.06.020
66. Suchman, M. C. (1995). Managing Legitimacy : Strategic and Institutional Approaches Author (s): Mark C . Suchman Source : The Academy of Management Review , Vol . 20 , No . 3 (Jul ., 1995), pp . 571-610 Published by : Academy of Management Stable URL : https://www.jstor.org. The Academy of Management Review, 20(3), 571–610.
67. Teoh, H. Y. T., & Thong, G. (1984). Another look at corporate social responsibility and reporting: An empirical study in a developing country. Accounting, Organizations and Society, 9(2), 189–206.
68. Tolliver, C., Fujii, H., Keeley, A. R., & Managi, S. (2021). Green innovation and finance in Asia. Asian Economic Policy Review, 16(1), 67–87.
69. Traxler, A. A., & Greiling, D. (2019). Sustainable public value reporting of electric utilities. Baltic Journal of Management, 14(1), 103–121. https://doi.org/10.1108/BJM-10-2017-0337

70. Trisnawati, L. P. P., Nawangsari, L. C., Johannes Lo, S., Zainal, V. R., & Irmaningsih, E. S. (2022). Literature Review of Corporate Sustainability in Practices (The Implementation of Green Accounting in Modern Industries). International Journal of Social Science And Human Research, 05(11), 5182–5191. https://doi.org/10.47191/ijsshr/v5-i11-48
71. Tu, J. C., & Huang, H. S. (2015). Analysis on the relationship between green accounting and green design for enterprises. Sustainability (Switzerland), 7(5), 6264–6277. https://doi.org/10.3390/su7056264
72. Voaindonesia. (2023). Emisi Karbon Dioksida Capai Rekor Tertinggi pada 2022. Voaindonesia.Com. https://www.voaindonesia.com/a/emisi-karbon-dioksida-capai-rekor-tertinggi-pada-2022-/6989649.html
73. Wiseman, J. (1982). An evaluation of environmental disclosures made in corporate annual reports,. Accounting, Organizations and Society, 7(1), 53–63.
74. www.pln.co.id. (2022). Terbaik Sepanjang Sejarah, PLN Raih 15 Penghargaan Proper Emas dan CEO Green Leadership Utama. Press Release No. 1016.PR/STH.00.01/XII/2022. https://web.pln.co.id/media/siaran-pers/2022/12/terbaik-sepanjang-sejarah-pln-raih-15-penghargaan-proper-emas-dan-ceo-green-leadership-utama
75. Yakhou, M., & Dorweiler, V. P. (2004). Environmental accounting: An essential component of business strategy. Business Strategy and the Environment, 13(2), 65–77. https://doi.org/10.1002/bse.395
76. Zainab, A., & Burhany, D. I. (2020). Biaya Lingkungan, Kinerja Lingkungan, dan Kinerja Keuangan pada Perusahaan Manufaktur. Industrial Research Workshop and National Seminar, 26–27.