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Analysis of the Application of Environmental Accounting at PT. Perusahaan Gas Negara Tbk on the Indonesia Stock Exchange (IDX) and its compliance with the Global Reporting Initiative (GRI) standards

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A B S T R A C T

This study examines the implementation of environmental accounting at PT Perusahaan Gas Negara Tbk based on Global Reporting Initiative (GRI) standards. Using a qualitative descriptive approach, the research assesses whether the company's environmental accounting system and sustainability report are appropriately presented. The findings indicate that the company's sustainability report includes environmental cost reporting, eco-friendly material reporting, energy reporting, biodiversity reporting, emissions reporting, waste and effluent reporting, and water reporting, all aligned with GRI standards. Additionally, the company provides environmental cost reports covering prevention, detection, internal failure, and external failure costs.

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INTRODUCTION

In the context of modern business, the role of accounting is not only limited to recording financial transactions, but also extends to aspects of resource management and company performance reporting. The oil and gas industry, as one of the vital economic sectors, also plays an important role in the global economy. However, along with the significant environmental impact generated by its operations, attention to the environmental aspects of accounting practices has become increasingly urgent. The importance of awareness of several industries in managing waste shows a form of compliance and openness to regulations regarding industrial waste management from their operations. The industry provides an overview of its high sensitivity to environmental issues or what is called a high profile industry (Mery Wanialisa & Estu Mahanani, 2021).

According to Ikhsan in the book Husnatarina Fitria (2024:3), environmental accounting is an effort to prevent, reduce, or even avoid environmental impacts by trying to gradually improve and reduce incidents related to disasters that may be involved in business activities. Environmental accounting refers to the accounting practice in a company, where environmental accounting information is recognized and recorded in the company's financial statements. Environmental accounting is still a topic that is relevant to recent developments, especially in terms of environmental sustainability. By conducting research on this topic, it is possible to get a clear picture of the company's efforts in managing the environment and report it transparently through sustainability and environmental cost reports.

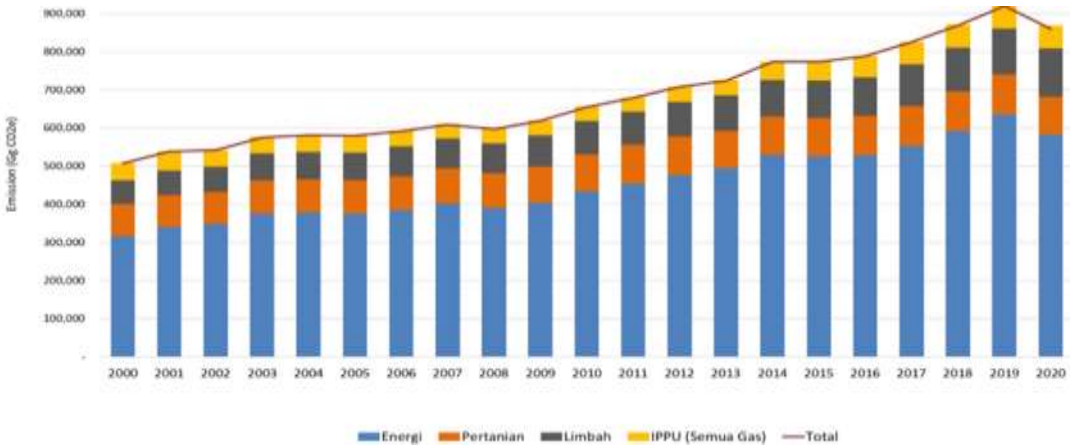


Figure 1. National GHG Emission Profile 2000 – 2020

Source: Ministry of Environment and Forestry, (2022)

The selection of PT Perusahaan Gas Negara Tbk to be the object of research is not without clear reasons The State Gas Company supports the government's program to increase the use of clean energy through national natural gas distribution. This effort is the company's main sustainability step that is adjusted to the company's role in the energy transition period towards Net Zero Emission (NZE) in 2060. on the other side, PT. The State Gas Company is classified as an energy sector on the Indonesia Stock Exchange. Based on the Greenhouse Gas (GHG) Inventory and Monitoring, Reporting, Verification, (2022) Report in Figure 1.1 above, it shows that from 2000-2020 the energy

sector has always been the largest contributor to GHG emissions in Indonesia. In fact, this trend tends to increase from 2000 to 2020. As of 2020, the energy sector contributes 56 percent to total GHG emissions in Indonesia. It can be concluded that the energy sector has a great impact on the environment.

The government supports the company's responsibility to the environment. According to Law Number 40 of 2007 article 1 concerning Limited Liability Companies, which states that "Social and environmental responsibility is the company's commitment to participate in sustainable economic development in order to improve the quality of life and the environment that is beneficial, both for the company itself, the local community, and the community in general". There are still many companies that do not have sustainability reports, this is what causes the environment to be damaged because there is no managerial in dealing with the environment in this case is environmental financial records, so that the company does not know the cost of waste management and cost savings regarding the company's environment, in the end the company cannot continue its business because it is not in accordance with sustainability report regulations. PT Perusahaan Gas Negara is one of the companies that already owns and presents sustainability reports which contain information related to environmental accounting and environmental costs. The impacts caused by the company include solid waste, liquid waste, air emissions, hazardous and toxic waste (B3), energy use and greenhouse gas emissions.

The success of environmental accounting depends not only on the accuracy in classifying all costs incurred by the company, but also on the accuracy of the company's accounting data to reduce the environmental impact arising from the company's activities. Through the analysis of the application of environmental accounting, it can evaluate whether PT. State Gas Companies are responsible for the environmental impact generated by their operational activities. Another goal is to assess the extent to which the practices that have been carried out are environmentally friendly or environmentally destructive. Therefore, the first step in environmental restoration efforts is to identify practices that have a significant impact on the environment, then calculate the costs and look for alternatives (Ioppolo et al., 2019).

The theory of legitimacy was developed through a concept of organizational legitimacy put forward by Dowling & Pfeffer (1975). Legitimacy theory is a theory that can help companies in providing motivation to continue to carry out good disclosure based on the company's operational activities so that the public can understand it well by external parties. This theory itself can be interpreted as a description of activities that help companies in disclosing sustainability reports.

According to (Sukaharsono et al., 2020:25) A sustainability report contain s reports related to environmental accounting and company cost accounting. Sustainability reports are announced to the public that contain reports on the economic, financial, social, and environmental performance of a financial services institution.

In addition, it is important to check the suitability of the reporting practices of PT. State Gas Company with Global Reporting Initiative (GRI) Standards. Sustainability reports disclosed by companies must be aligned with standardized reporting guidelines. The sustainability reporting guidelines that are a reference for many companies in Indonesia are the guidelines developed by the Global Reporting Initiative (GRI), which is called the GRI Standard. The GRI is seen as one of the most comprehensive and reliable guidelines because it has been published globally and is supported by a report structure that represents the interests of various parties. The use of GRI's sustainability reporting guidelines has been practiced by more than 1000 companies around the world, both private and government organizations such as Unilever, Freeport, UK Government, and Japan Environment Agencies (Rahayu, 2019). With reference to the sustainability standards that have been issued by the Global Sustainability Standards Council in October 2021 regarding the GRI standards for the oil and gas sector which came into effect for reporting in January 2023, where the standards issued include; environmental cost reporting, eco-friendly materials reporting, energy reporting, biodiversity reporting, emissions reporting, waste and effluent reporting, and water reporting.

Based on the background, a study will be conducted with the title "Analysis of the Application of Environmental Accounting at PT. Perusahaan Gas Negara Tbk on the Indonesia Stock Exchange and its Compliance with Global Reporting Initiative (GRI) Standards".

THEORETICAL REVIEW

Definition of Accounting

Zain Adriani. A et al., (2024:1) states that accounting is part of the social sciences that are formed by human products, and have an influence on the existence of humans in a group of people. Meanwhile, according to Kartomo & Sudarman La (2019:2), accounting is a company language that is useful for providing information in the form of company financial data that can be used for decision-making. Accounting can be interpreted as recording, measuring and reporting transactions and events of a financial nature and interpreting the results.

Management Accounting

According to Darya I. G. P (2019:11) management accounting is "the process of identifying, measuring, accumulating, analyzing, compiling, interpreting, and communicating information used by management to plan, evaluate, and control in an entity. Management accounting can be interpreted as a process of activities in identifying, analyzing, and communicating economic events, to produce management information that can be used by internal parties in the decision-making process in an organization.

Environmental Accounting

Ikhsan (in Husnatarina Fitria, 2024:3) defines environmental accounting as an effort to prevent, reduce, or even avoid environmental impacts by trying

to gradually improve and reduce disaster-related incidents that may be involved in business activities. Environmental accounting refers to the accounting practice in a company or government agency, where environmental costs are recognized and recorded in a company's financial statements. Environmental accounting is a concept that serves as a bridge between the business world and environmental responsibility (Samosir et al., 2024: 75).

Environmental Accounting Reporting

Agustina Dian et al. (2022: 156) Environmental accounting reporting contains information about company activities towards the environment. Environmental accounting reporting includes information regarding the use of natural resources, emissions, pollution, waste, and costs of a company's efforts to reduce negative impacts on the environment. Nowadays, more and more companies are starting to care about the environmental impact of their business activities. This is due to increasing public awareness and increasingly stringent government regulations related to the environment. Large companies have usually started implementing environmental accounting reports as part of their corporate social responsibility and have started reporting the environmental impact of their activities in the form of sustainability reports. However, there are still many companies that are not fully transparent in reporting their environmental information, so efforts are still needed to improve the quality and openness of the report.

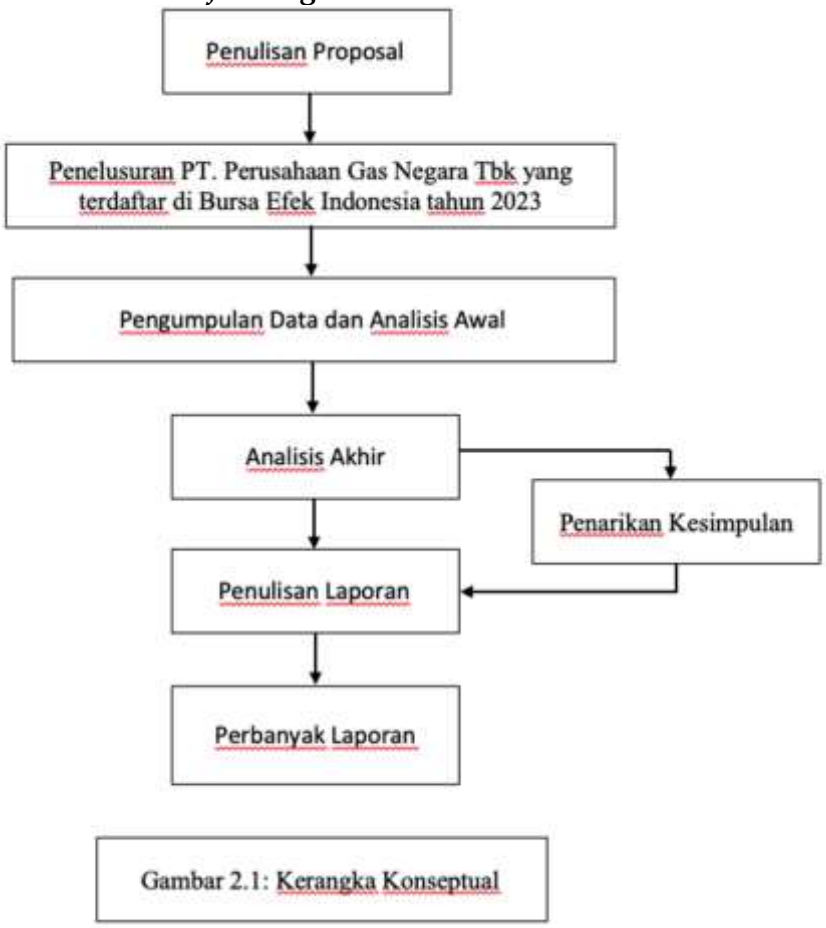
Sustainability Report

According to Ulupui I Gusti K. A et al. (2021:90), a sustainability report is a report published by companies and organizations regarding economic, environmental, and social impacts caused by operational activities. OJK defines sustainability reports as a form of report announced by issuers, public companies, or financial services institutions in order to disclose or communicate to all stakeholders about economic, financial, social, environmental, and accountable good governance performance. A sustainability report is a report that contains not only information on the company's financial performance, but also non-financial information such as social activities and the company's environment that allows the company to grow sustainably (sustainable performance).

GRI (Global Reporting Initiative)

Through www.globalreporting.org, the Global Reporting Initiative (GRI) is an independent international organization that develops sustainability reporting standards (Sustainability Report). GRI provides information for the government sector in understanding the current impact. For example, climate change, governance, human rights, and social welfare. This will facilitate efforts to create a real action in the management and formation of benefits for social, environmental, and economic aspects.

Conceptual Framework of Thought



Gambar 2.1: Kerangka Konseptual

METHODOLOGY

In this study, data collection uses the documentation method by looking at the annual report which contains sustainability reports and environmental cost reports. The company must present financial data and sustainability reports that can be analyzed for conformity with GRI standards. The election of PT. Perusahaan Gas Negara Tbk because this company already owns and presents sustainability reports which contain information related to environmental accounting and environmental costs.

The analysis method that will be used in this study is the descriptive analysis method. Qualitative descriptive research is one of the types of research that is included in the type of qualitative research. Descriptive research can help to provide an in-depth picture of PT. State Gas Companies and the extent to which they comply with Global Reporting Initiative (GRI) standards

RESULTS

Environmental Cost Reporting of PT Perusahaan Gas Negara Tbk

Reporting environmental costs is an important step for companies to demonstrate their commitment to sustainability and transparency in environmental management. PT. Perusahaan Gas Negara (PGN), as one of the largest energy companies in Indonesia, certainly has the obligation and initiative to report costs related to its business activities that have an impact on the environment.

Table 1. Realization of Environmental Management of PT Perusahaan Gas Negara Tbk (expressed in rupiah)

Allocation	2021	2022	2023
Preparation of AMDAL/UKL-UPL documents and management of environmental permits	550.735	3.689.885	-
Environmental monitoring	2.057.875	4.936.464	3.903.162
Environmental campaigns	1.387.185	1.548.117	2.057.382
B3 waste management Environmental management related to proper	3.548.427	22.641.355	7.607.195
Environmental Training	184.100	1.431.892	267,866
Energy monitoring system and carbon calculator			
Calibration of Environmental Measuring Instruments	1.117.805	397.348	269.959
Program efisiensi energi	19.624	469.156	142.973
Environmental management facilities for B3 waste TPS	74.800	434.092	-
Environmental report Environmental management system	374.625	490.731	606.762
Environmental management system	-	208.154	34.000
Construction of a temporary disposal site for B3 waste	-	865.800	-
Creation of secondary containment	-	-	-
Domestic WWTP Development	915.000	-	740.000
Environmental Studies	89.610	-	130.000
Wastewater Management	-	1.424.739	3.442.122
Environmental Permit Management (Adjustment of Environmental Permits to Environmental Approvals, Extension of LB3 TPS Permits, WWTP and Emissions)	-	-	1.002.274
Total	10.319.786	38.537.739	20.203.697

Source: Original Data of PT. Perusahaan Gas Negara Tbk in 2023 (*) in Millions of Rupiah

Based on table 4.1 of the realization of environmental costs of PT. Perusahaan Gas Negara Tbk, the breakdown of environmental costs will have an impact on the company's profitability. In the three years of reporting, it is known that the total environmental cost allocation in 2022 has increased from the previous year of IDR 28,217,953 and decreased in 2023 by 18,334,042. The

company can achieve efficiency in environmental management of around 18 million rupiah in 2023. The smaller the environmental cost, the zero point of damage will be obtained.

Reporting of Environmentally Friendly Materials of PT Perusahaan Gas Negara Tbk

PT. State Gas Companies need pipelines as an essential component. These pipes are of a certain length and are usually made of materials such as steel, galvanized, or polyethylene (PE). This type of pipe is used in accordance with applicable standards and codes for transporting flammable gases, and is not included in the category of renewable materials.

The total length of the company's pipeline network in 2023 is 12,692 km. All of these pipes are coated with a special protective layer to prevent rust, so that the pipes can be planted in the ground for a long period of time, about 30 years. The pipe is also equipped with a filter to capture impurities such as water vapor or other substances that may be dissolved in natural gas, so that the quality of the gas is well maintained. These filters are periodically replaced and the used filters are considered solid waste. In delivering its products, the company does not use packaging, materials that fall into the category of renewable, recycled, or used products. Regular inspections and maintenance of distribution pipelines are also carried out to ensure that the pipeline is operating in accordance with its function and prevent leaks or other disasters.

Rapport énergétique de PT Perusahaan Gas Negara Tbk

Energy is the main need to run the Company's operations. The company uses various types of energy, including electrical energy from the State Electricity Company (PLN) for lighting and the use of electronic equipment in offices as well as operational equipment for offtake/gas stations. Fuel Oil (BBM) is also used as an alternative fuel for Diesel Engine Generator (DEG) which functions as a backup in the event of an emergency such as a power outage. Fuel is also used as fuel for the company's operational vehicles.

The company also uses Fuel Gas (BBG) as fuel for operational vehicles and as fuel for Gas Engine Generator (GEG), which is then used for lighting, electronic equipment in offices, and offtake network equipment/gas stations that are not connected to electricity from PLN.

In 2023, energy consumption used to distribute natural gas will reach 551,593.77 GJ. The Company has succeeded in energy efficiency so that with less energy use in 2023 compared to 2022 and the Company is able to distribute gas with a larger volume in 2023 compared to 2022. This energy efficiency can be seen from the decrease in energy intensity and energy savings obtained.

Biodiversity Reporting of PT Perusahaan Gas Negara Tbk

PT. The State Gas Company is committed to maintaining and enhancing biodiversity at all of the company's work sites. By setting No Net Loss (NNL) and Net Positive Impact (NPI) targets, the company proactively ensures that any negative impacts on biodiversity from new projects or ongoing operational activities are not only offset, but also make a positive contribution.

The company's operational area is located far from protected areas, so there is no negative impact on biodiversity, including protected flora and fauna. Nevertheless, the company actively supports efforts to protect biodiversity in Indonesia through various sustainable environmental initiatives. Meanwhile, based on hierarchical mitigation, the company's biodiversity management is carried out through an avoidance strategy.

As part of its efforts to protect biodiversity, the company identifies endemic and protected species before carrying out operational activities. If there are threatened species, the Company will move them to a conservation area that has been prepared or to an area that is not affected by the company's operations. All of these steps involve authorities, such as the local Environment Agency, and companies conducting regular reporting to ensure that all processes are in accordance with applicable regulations.

Emission Reporting of PT. Gas Negara Tbk

PT. The State Gas Company supports Pertamina Holding to achieve a 30% emission reduction by 2030 and zero carbon emissions (Net Zero Emission) by 2060 through GHG emission reduction. The company has been calculating its carbon footprint since 2012 using a carbon calculator that refers to PERMENLH No. 12 of 2012 concerning Guidelines for Calculating the Emission Burden of Oil and Gas Industry Activities, guidelines for greenhouse gas inventories from the Intergovernmental Panel on Climate Change (IPCC), and the GHG Protocol.

The Company is committed to implementing the Safety, Occupational Health, Security, Environmental Management, and Energy Management System (K3P2LE) with a target of reducing total emissions by >0.09% from the Business as Usual (BAU) level by 2023. This target has been approved by the management for the 2020-2024 period. As a responsibility for monitoring and controlling emission reductions, the Company has a PROPER structure that is tasked with ensuring that all provisions in the PROPER implementation regulations are met.

Conventional Emissions

The company's operational activities produce conventional emissions that come from the combustion of fuel in turbines and generator engines. To ensure that the emissions produced do not result in a decrease in air quality, monitoring and measuring emissions in combustion chimneys which are stationary sources are carried out. The emission parameters and thresholds used in the measurement refer to the Regulation of the Minister of State for the Environment No. 13 of 2009 concerning Emission Standards for Immobile Sources for Oil and Gas Businesses and/or Activities, as well as the Regulation of the Minister of Environment and Forestry No. 11 of 2021 concerning Engine Emission Standards with Internal Combustion. The results of measurements during 2023 show that significant emission parameters still meet the emission standards that have been set.

Biomethane

The company's commitment to reducing carbon emissions, especially methane emissions, is realized through exploring the potential business of using methane emissions from palm oil waste. The waste site's proximity to our gas network allows methane gas capture and distribution to the company's customers, either by injection into existing gas pipelines or through CBM (Compressed Bio Methane) systems. Biomethane, which has a similar content to Natural Gas, can be used directly by end consumers such as vehicles, power plants, and heating systems without the need to change existing equipment. With the development of biomethane, by 2030 it is expected to reduce carbon emissions by up to 2.2 million tons of CO-eq per year.

Waste and Effluent Reporting of PT Perusahaan Gas Negara Tbk

Waste

Afin de se conformer aux lois et réglementations, toute activité commerciale est tenue de mener des actions de gestion et de traitement des déchets afin de prévenir les impacts négatifs sur l'environnement. La gestion des déchets peut se faire de diverses manières, telles que la réduction, le recyclage, la réutilisation ou l'élimination responsable. Based on its nature, the company produces three types of waste, namely hazardous and toxic material waste (B3 waste), such as used oil, used paint, and chemical packaging. Non-B3 waste such as general waste that does not fall into the B3 category and gaseous waste, which is the result of combustion from production. Hazardous and toxic wastes such as used oil, used paint, and chemical packaging, if disposed of carelessly, can contaminate soil and water, and endanger the health of humans and other living things. Non-B3 waste, such as daily household waste from offices and operational facilities, if not properly managed, can become a breeding ground for mosquitoes and rats, as well as cause unpleasant odors. Gases from combustion from production equipment, such as carbon dioxide (CO2), sulfur dioxide (SO2), and nitrogen oxides (NOx). If left uncontrolled, it can cause the greenhouse effect, acid rain, and respiratory problems in humans.

Waste management at PGN involves several important stages that aim to minimize negative impacts on the environment. Certain B3 waste is treated by burning at high temperatures in an incinerator to destroy hazardous substances after which the B3 waste is handed over to a third party who has a permit to manage B3 waste, such as a special incinerator or B3 landfill. Non-B3 waste that cannot be recycled or processed again will be taken to a specially managed landfill. For waste gas, the company controls emissions using equipment such as scrubbers, filters, and catalysts to reduce harmful gas emissions into the air.

Effluent

Regarding wastewater disposal, the company only discharges water that comes from domestic activities as well as infrastructure maintenance such as cleaning pipes and machinery. The company is committed to preventing environmental pollution by applying the principles of reduce, reuse, recycle, and restore (4R) in an effort to improve the quality of liquid waste disposal.

The wastewater disposal process in the company involves the initial stage of treatment in the API Separator unit to ensure that the waste produced is in accordance with the standard waste quality standards that have been set. Waste and gas treatment plants are placed at a greater distance from residential areas as compared to distribution pipelines. This is done to minimize the risks that may occur. Even though a safe distance has been determined, periodic monitoring of gas installation conditions is still necessary. This aims to ensure that the installation is always in good condition and minimize the risk of accidents. During 2023, The company is not faced with sanctions for violations of regulations related to water use and discharge of treated wastewater. The majority of the water used for the company's operational activities is purchased from third parties. The company has not been able to disclose information about water supply in difficult water locations (water stress) because the majority of water availability comes from third parties.

PT Gas Negara Tbk Water Reporting

PT. The State Gas Company is committed to carrying out water use efficiency initiatives in accordance with PGN's HSSE policy which has been approved by the President Director in August 2023. The Company aims to protect the environment by utilizing sustainable resources, monitoring water quality, and complying with regulations related to wastewater disposal permits.

PGN carries out gas distribution and transmission activities that do not require the use of water. However, for maintenance purposes such as cleaning pipes, equipment, and other infrastructure, a relatively small amount of water is required. The main use of water is to meet domestic needs at PGN's headquarters and operational support facilities. Although the use of water for maintenance is minimal, PGN still maintains the efficiency of water use and strives not to have a negative impact on the environment.

PGN obtains water supply from the Regional Drinking Water Company (PDAM) and also uses groundwater taken in accordance with the stipulated terms of use. Water withdrawal from these two sources does not have a detrimental impact on water sources for communities and water ecological needs. Efforts to improve water efficiency in office areas are carried out by utilizing sensor-based faucet and toilet technology, as well as holding a campaign to increase the awareness of Gas Subholding Officers to be more efficient in water use. The use of water and wastewater produced in the operating unit is no more significant than the office area and is efficient and meets the quality standards set by the government.

DISCUSSION

Environmental Accounting Compliance with Global Reporting Initiative Standards

PT Perusahaan Gas Negara Tbk (PGN) is a pioneer company in Indonesia in the transportation and distribution sector of natural gas. During its more than six decades of operation, the company has made an important contribution to

meeting domestic gas needs. In the era of energy transition, the company plays a strategic role in the energy conversion from fossil energy to renewable energy, especially in the conversion of natural gas-based energy or gasification in strategic sectors such as the national electricity sector.

Table 2. Environmental Management Fees of PT Perusahaan Gas Negara Tbk

1. Environmental Prevention Costs			
Allocation	2021	2022	2023
Preparation of AMDAL/UKL-UPL documents and management of environmental permits	550.735	3.689.885	-
Environmental campaigns	1.387.185	1.548.117	2.057.382
Environmental Training	184.100	1.431.892	267,866
Energy efficiency program	19.624	469.156	142.973
Environmental management system	-	208.154	34.000
Domestic WWTP Development	915.000	-	740.000
2. Environmental Detection Costs			
Allocation	2021	2022	2023
Environmental monitoring	2.057.875	4.936.464	3.903.162
Calibration of Environmental Measuring Instruments	1.117.805	397.348	269.959
Environmental Studies	89.610	-	130.000
3. Internal Failure Costs			
Allocation	2021	2022	2023
B3 waste management Environmental management related to proper	3.548.427	22.641.355	7.607.195
Construction of a temporary disposal site for B3 waste	-	865.800	-
Wastewater Management		1.424.739	3.442.122
4. External Failure Costs			
Allocation	2021	2022	2023

Environmental report Environmental management system	374.625	490.731	606.762
Environmental management system	-	208.154	34.000
Environmental Permit Management (Adjustment of Environmental Permits to Environmental Approvals, Extension of LB3 TPS Permits, WWTP and Emissions)	-	-	1.002.274
Total Keseluruhan Biaya	**10.319.786**	**38.537.739**	**20.203.697**

Source : Processed Data 2024 * in millions of rupiah

In table 2 above, it can be seen that the company has shown a significant commitment to environmental management. The company has reported four categories of environmental costs, namely prevention costs, environmental detection costs, internal failure costs, and external failure costs. The company already has a good foundation in environmental cost reporting. This can increase public and investor confidence, in terms of business, more and more sustainability-oriented investors (ESG investing) and looking for companies with good environmental performance.

PT. The State Gas Company also reports the budget allocated for various environmental activities. In the three reporting years, it is known that the total environmental costs in 2023 decreased by 18,334,042 from the previous year, meaning that the company was able to achieve efficiencies in environmental management of around 18 million rupiah in 2023. The smaller the environmental cost, the zero point of damage will be obtained.

CONCLUSIONS AND RECOMMENDATIONS

With the conduct of research related to the analysis of the application of environmental accounting at PT. Perusahaan Gas Negara Tbk which is listed on the Indonesia Stock Exchange and its compliance with the Global Reporting Initiative Standards, can be concluded as follows:

1. The application of environmental accounting at PT. Perusahaan Gas Negara Tbk published in the sustainability report, including; Environmental Cost Reporting, Green Materials Reporting, Energy Reporting, Biodiversity Reporting, Emissions Reporting, Waste and Effluent Reporting, and Water Reporting. All environmental accounting reporting is in accordance with the Global Reporting Initiative (GRI) Standards.
2. PT. Perusahaan Gas Negara Tbk has presented a report on the environmental costs owned by the company such as prevention costs, environmental detection costs, internal failure costs and external failure costs. This can increase public and investor confidence, from a business perspective. Sustainability-oriented investors (ESG investing) are increasingly looking for companies with good environmental performance.

FURTHER STUDY

It is hoped that the presentation of sustainability reports is not just a qualitative report, so that the information produced is transparent.

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