Development of a Sustainability Assessment Model for Transmission Unit Using Business Processes Indicator Approach

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Abstract. The growing global emphasis on sustainability has emerged as a critical concern across various sectors, including the power and utility industries. As a state-owned enterprise in the electricity sector, PT PLN (Persero) has articulated its strategic sustainability policies in the corporate long-term plan and the board of directors' regulations on sustainable business strategies. PT PLN (Persero) also has adopted the Global Reporting Index (GRI) as an objective framework for assessing sustainability performance, which is currently implemented at the corporate level. However, technical guidelines for implementing sustainability as a derivative of these policies remain incomplete, and a sustainability assessment mechanism has not yet been established by the corporation for the transmission unit. Furthermore, PT PLN (Persero) currently conducts performance evaluations only at the strategic and tactical levels, leaving performance assessment frameworks at the process level undefined. Therefore, it is necessary to identify relevant business process indicators aligned with sustainability activities in transmission unit. This study proposes a model and framework for developing business process indicators to assess performance at the operational level. The proposed assessment framework aims to address sustainability issues and challenges faced by the transmission unit, encompassing economic, environmental, social, and governance aspects. The final model resulting from this research is designed to be integrated into the existing performance evaluation framework, forming a component of the Kontrak Manajemen for the transmission unit.

Keywords: *Sustainability, Transmission, Indicator, Business Process.*

1 Introduction

In recent decades, global attention to sustainability issues has significantly increased, particularly in addressing the challenges of climate change, resource scarcity, and the need for sustainable development. Stakeholders, including governments, civil society, and businesses, have demonstrated their commitment to integrating sustainability principles across various economic sectors. The future we want document [1] outlines that each country has its own sustainable development goals, shaped by unique challenges, which are collectively

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encapsulated in the 17 Sustainable Development Goals (SDGs) introduced by the United Nations in 2015. In response, global initiatives such as the SDGs and the paris agreement have encouraged businesses to innovate and transform in support of the global sustainability agenda [1].

The energy and electricity sectors have emerged as key areas of focus due to their strategic role in the transition toward a low-carbon economy. The adoption of renewable energy, enhancement of energy efficiency, and implementation of clean technologies are among the top priorities for achieving global sustainability targets [2]. Companies in these sectors face increasing pressure to mitigate environmental impacts while simultaneously meeting growing energy demands.

The implementation of sustainability has become a mandatory obligation for all stated-owned company, including PT PLN (Persero). To achieve its corporate objectives in line with its vision and mission, PT PLN (Persero) has established strategic policies and corporate strategies at the corporate level in the form of internal regulations. This is outlined in the board of directors regulation 0045.P/DIR/2024 regarding PT PLN (Persero)'s sustainable business strategic policy. However, this regulation only provides a strategic framework that remains general and normative in nature. It addresses sustainability challenges and issues at a strategic level, focusing on the company's objective strategies. aligning corporate strategies with operational processes is a critical step to ensure sustainability efforts are implemented consistently across all levels of the organization [3]. Therefore, there is a pressing need for more technical operational guidelines to serve as a reference for all entity units in integrating sustainability aspirations into business processes.

PT PLN (Persero), as an electricity business entity, operates across four main business lines: primary energy, generation, transmission, and distribution [4]. Each business line plays an equally critical role in advancing sustainability and supporting the roadmap towards net zero emissions by 2060. The operationalization of sustainability requires integrating organizational-level goals with specific, measurable processes at the unit level to address unique operational challenges [5], including the transmission unit. As an operational unit responsible for electricity transmission services also faces challenges in implementing sustainability at the operational level. To effectively execute the company's objective strategies related to sustainability, operational strategies at the level of the transmission unit's business processes are required.

According to Kaplan and Norton [6] emphasize the importance of identifying core processes and linking them to performance measures to ensure alignment with strategic priorities. PT PLN (Persero) has identified the business processes of its transmission unit, divided into fourteen business process activities at

primary level based on PLN board resolution 0330.K/DIR/2023. Among these activities, five are designated as core business processes within the transmission unit. These include: acquiring, constructing, and managing assets; managing the supply chain; operating utility assets; providing services to customers; and managing customer service.

In conducting business activities, organizations need to identify performance measurements at all levels: strategic, tactical, and operational [7]. Currently, PT PLN (Persero) implements performance evaluations only at the strategic level for corporate assessments and the tactical level for operational units. However, at the operational level, there is no existing model or framework that can be integrated into Kontrak Manajemen. As Neely et al. [8] argue, the absence of performance evaluation frameworks at the operational level can lead to a disconnect between organizational strategy and day-to-day processes.

In executing all business process activities, an organization must identify performance measurements for each input, process, and output [9]. The initial step involves identifying performance assessments for each description of inputs, processes, and outputs across the business processes comprehensively. This also applies to the transmission unit's business processes, particularly the core business processes, which must undergo performance identification aligned with sustainability-related activities. Schaltegger and Wagner [10] highlight that sustainability-oriented performance measures should encompass Environmental, Social, and Governance (ESG) aspects to reflect the broader objectives of sustainability integration.

Creating customized sustainability performance models can significantly enhance the ability of organizations to meet their strategic and operational goals while addressing stakeholder expectations [11]. Therefore, it is essential to develop a sustainability assessment model based on business process performance indicators tailored to the transmission units. This model will enable a more comprehensive integration of sustainability considerations into operational-level business processes, ensuring alignment with corporate objectives and management contract.

The objectives of this research are to address the identified issues by developing an operational performance assessment model for the core business processes of transmission units. Additionally, this research aims to identify sustainability performance assessment indicators within the transmission unit's business processes. Lastly, it seeks to provide feedback on incorporating sustainability business process performance indicators into the performance management framework of transmission units.

2 Methodology

A preliminary study has been conducted for this research, consisting of a literature review and field observations. The literature utilized includes books on business process management and recent journal articles, primarily from Elsevier and other Scopus-indexed journals. These journals focus on business process performance indicators and the implementation of sustainability in the energy and electricity sectors, serving as the theoretical foundation of this research.

Subsequently, the core business processes of the transmission unit were identified and mapped based on sustainability issues and challenges within each business process activity through a qualitative approach. This process resulted in the development of a current model and conceptual framework for the performance assessment of transmission units. Further, this model will be refined based on references and preliminary interviews with relevant stakeholders.

3 Result and Discussion

The initial interviews and observations with sustainability officer at Head Office PT PLN Persero as person in chart and also implementing team that build the system. In addition the result of initial discussion with organizational performance assessment teams within PT PLN (Persero) revealed the existing model for formulating and monitoring Kontrak Manajemen as part of the corporate performance management mechanism. This model is based on the PLN board of director regulations 007.P/DIR/2022 on corporate performance management and organizational performance assessment.

That policy defines corporate performance assessment as a series of activities carried out in stages, encompassing planning, monitoring, and evaluation, to support the achievement of optimal and continuously improving performance. It also outlines the mechanism for establishing management contracts, which include Key Performance Indicators (KPIs) and the determination of organizational performance scores. The mechanism for setting kontrak manajemen for the transmission unit refers to the document of RJPP, RKAP, and Priority Programs.

The primary reference for this process is the board of director regulations PLN 0019.P/DIR/2023 on strategic policies for corporate planning and strategy. This regulation outlines PLN's strategic aspects, including the company's vision, mission, and core values, which serve as the framework for corporate activities. To implement these strategic aspects, various objective strategies are formulated and documented in the company’s Long-Term Plan as we know RJPP document. The formulation of these objective strategies adheres to the board of directors

regulations 0114.P/DIR/2017 on guidelines for the development and monitoring of long-term plan implementation.

The conceptual framework employed in the development of these objective strategies is the Balanced Score Card (BSC), focusing on three key aspects: Customer, Internal Business Process, and Learning and Growth. The existing model is illustrated in the figure below.

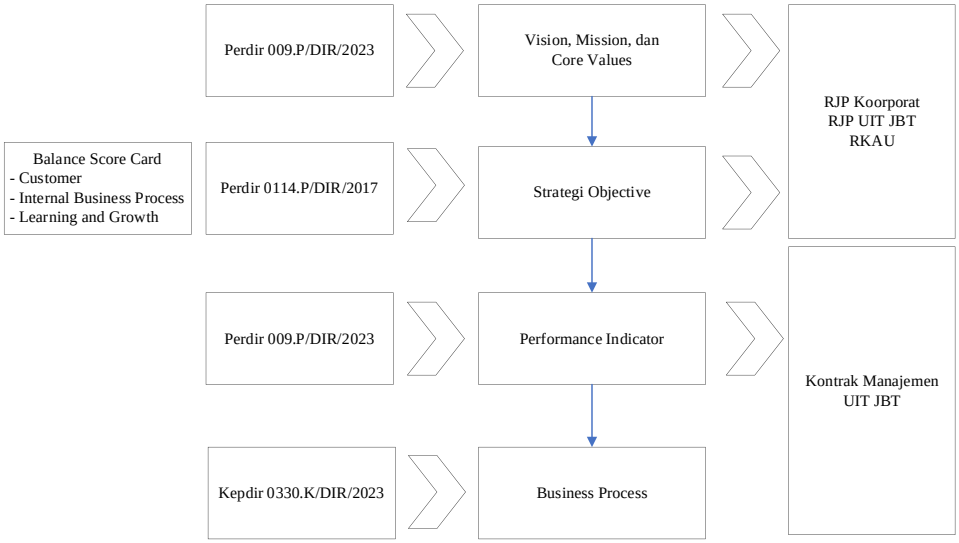

Figure 1 Existing Performance Assessment Model for PLN Transmission Units

3.1 Multi-Aspect Performance Assessment Model (Strategic, Tactical, and Process Levels)

There are three classifications of performance assessment indicators: strategic indicators, tactical indicators, and process indicators [12]. The detailed explanation of each classification is as follows:

a. Strategic Indicators assess the success parameters of the implementation of strategic objectives by evaluating the impact and outcome. This assessment is relevant at the corporate level to evaluate the success of top management at the company level.
b. Tactical Indicators assess the success parameters of executing work programs, which are action plans derived from strategic initiatives as part of the strategic objectives. This assessment is relevant for divisions and operational units, evaluating the success of middle management.

c. Process Indicators assess the execution of business process activities and evaluate the success of the output products and services generated. This assessment is relevant at the technical level, evaluating the success of business process owners.

The following illustration presents the measurement process model and the alignment of company performance across multiple aspects.

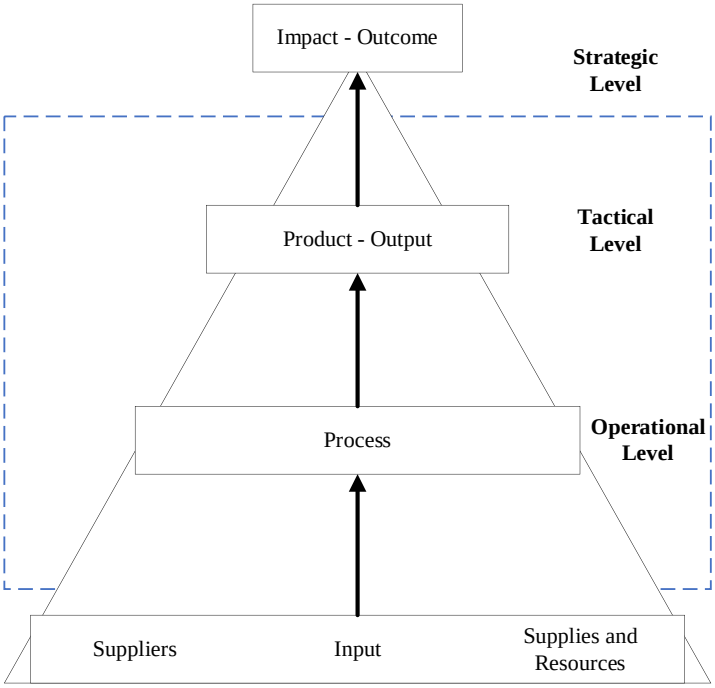

Figure 2 Multi-aspect performance assesment model

3.2 A framework commonly utilized in sustainability assessment

In assessing, reporting, and enhancing sustainability performance, the Global Reporting Initiative (GRI) framework serves as a benchmark for corporate sustainability performance indicators, providing standardized metrics to evaluate environmental, social, and governance aspects. GRI promotes transparency and accountability, enabling organizations to align their operations with global sustainability goals while meeting stakeholder expectations.

A bibliometric study by Mougenot and Doussoulin [13] revealed a significant increase in publications related to GRI from 1999 to 2020, with an annual growth rate of 21.9%. This indicates a growing academic and practical interest in the

application of GRI across various sectors, including energy and electricity. Another study by E-Vahdati and Aripin [14] highlighted that in the last 20 years, the trend of publications related to GRI has continued to rise, reflecting the importance of this framework in sustainability reporting and corporate performance assessment.

The application of the GRI framework is highly relevant in high-impact sectors such as energy and electricity. By utilizing GRI standards, companies can systematically assess their contributions to sustainability initiatives. In this regard, PT PLN Persero, as a company operating in the electricity sector, has also adopted the GRI framework to evaluate the success of its strategies at the corporate level. This aligns with findings that organizations adopting GRI reporting often show improved sustainability performance and enhanced stakeholder trust [15].

However, this assessment framework is only applicable for performance evaluations at the strategic level within the corporate context, as well as at the tactical level within operational units. For operational business processes, there is currently no model or framework that can be integrated with management contracts.

3.3 Input, Process, and Output Performance Assessment Model

The assessment classification in context is explained through several indicators [16], which include the following:

a. Input Indicators include materials, infrastructure, human resources, technology, and other inputs necessary for the production process.

b. Process Indicators assess the performance of activities, focusing on how tasks are performed to produce goods or services.

c. Product Indicators measure the output of goods or services produced by the company.

An illustration of this model can be seen in the figure below:

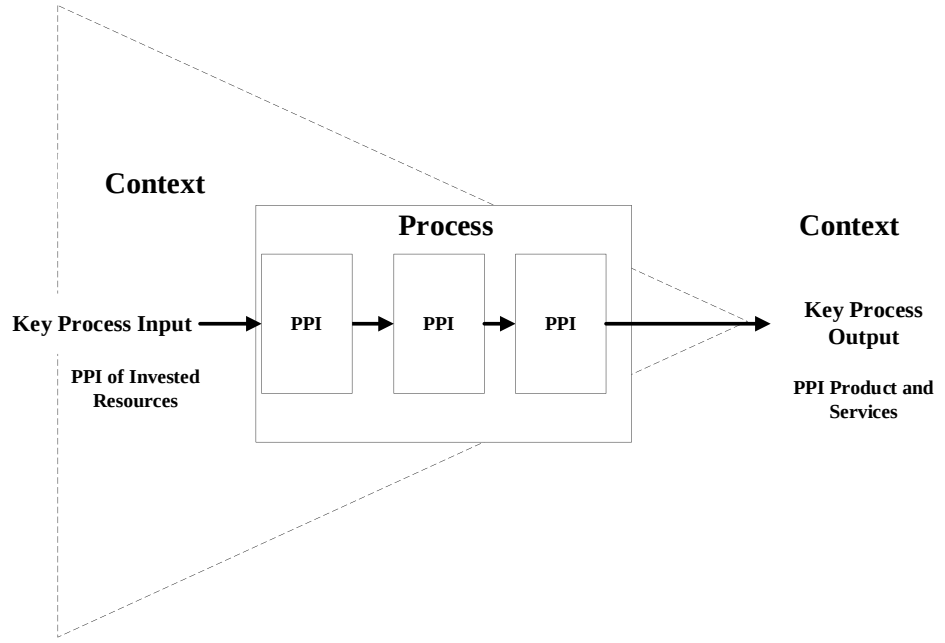

Figure 3 Input, process, output performance assesment model

3.4 Performance Assessment Model for Business Processes in Transmission Unit

The performance assessment model aligns with the existing management contract framework and aims to detail the classification of process indicators tailored to the business processes of the transmission unit. These business processes are defined based on Board Resolution 0030.K/DIR/2023 regarding the determination of PT PLN (Persero)'s business processes. According to this document, the business process of transmission unit consist of three part activities which include the following:

3.4.1 Input

The inputs for the business processes of transmission unit include the following:

a. RUPTL (Electricity Supply Business Plan)
b. RJPP (Company's Long-Term Plan)
c. Regulations
d. RKAP (Work and Budget Plan)
e. Stakeholder Aspiration
f. Coorporate Performance Guidelines

3.4.2 Process

The Process for the business processes of transmission unit include the following:

a. Acquiring, developing, and managing assets
b. Managing the supply chain
c. Operating utility assets
d. Providing services to customers
e. Manage for customer services

3.4.3 Output

The output for the business processes of transmission is electricity distribution services to customers.

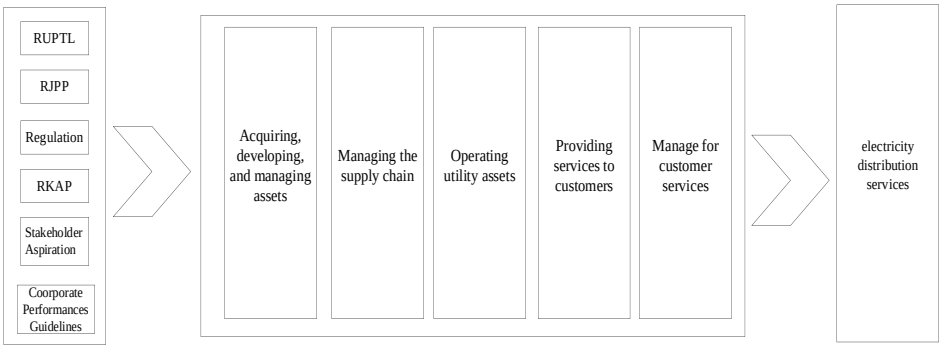

Figure 4 Current Conceptual Model for Research

3.5 Assessment Model of Input, Process, and Output in the Business Process of the Transmission Unit

From the above performance assessment model, several scenarios were derived from various supporting models, including the following:

3.5.1 Input Assessment

The first scenario involves evaluating the business process solely based on inputs, which consist of the RUPTL (Annual Utility Work Plan), RJPP (Corporate Long-Term Plan), regulations, RKAP (Annual Budget Work Plan), and stakeholder expectations. These inputs serve as supporting resources in terms of context, policies, and budget, which significantly influence the core processes within the business operations of the transmission unit.

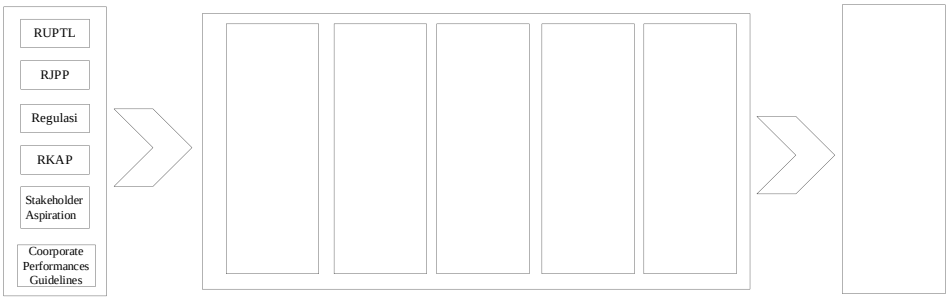

Figure 5 The scenario for input assessment

3.5.2 Process Assessment

The second scenario focuses on assessing the business process solely based on the core processes, which consist of five main activities. These core activities represent the primary business operations carried out by the transmission unit, viewed as an integrated whole, with the primary output being the delivery of electricity transmission services.

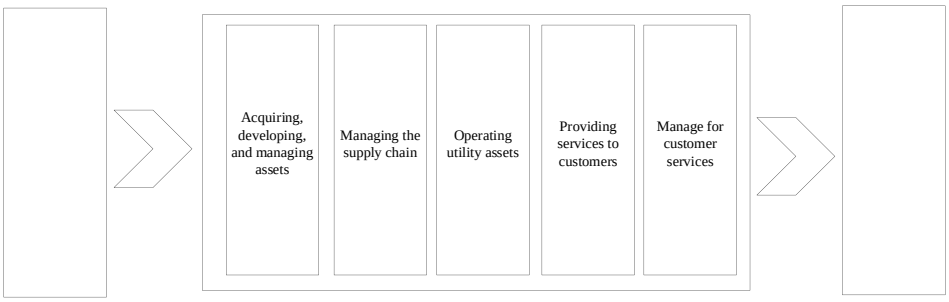

Figure 6 The scenario for process assessment

3.5.3 Output Assesment

The third scenario evaluates the business process solely based on the output of the core process, which is the electricity transmission service. This output serves as the basis for performance evaluation, representing the final product of the business process in the transmission unit.

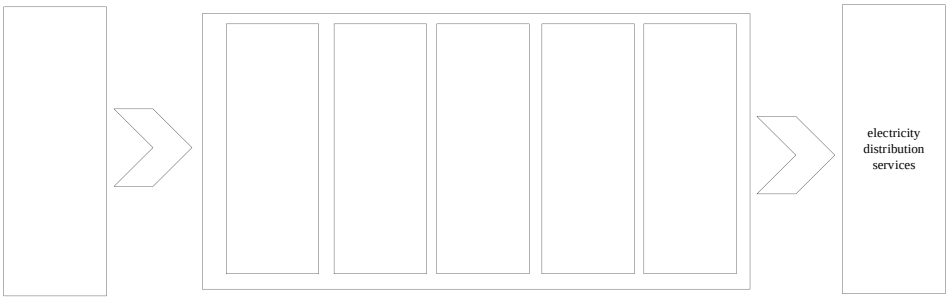

Figure 7 The scenario for output assessment

3.5.4 Input – Process Assessment

The fourth scenario combines the evaluation of business processes based on both inputs and processes. This approach considers the relationship between supporting resources such as RUPTL, RJPP, regulations, RKAP, and stakeholder expectations and the core activities in the business process. This assessment aims to analyze how the quality and alignment of inputs influence the effectiveness of the core processes in achieving the Transmission Parent Unit's objectives.

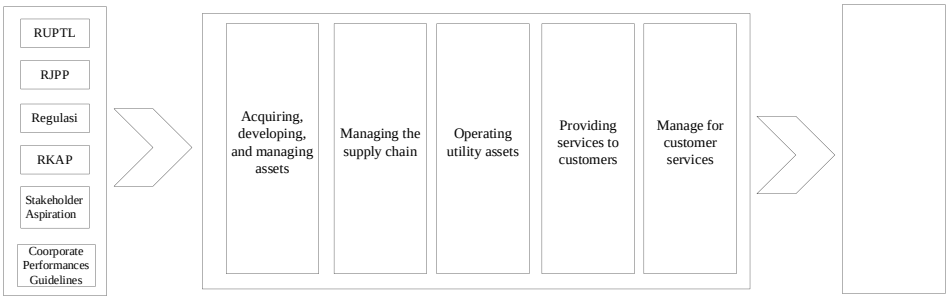

Figure 8 The scenario for intput-process assessment

3.5.5 Process – Output Assessment

The fifth scenario focuses on the assessment of business processes by linking core processes with their outputs. This perspective evaluates how well the five main activities within the business process contribute to the delivery of electricity transmission services. It aims to ensure that the core processes are optimized to consistently produce high-quality outputs aligned with stakeholder expectations.

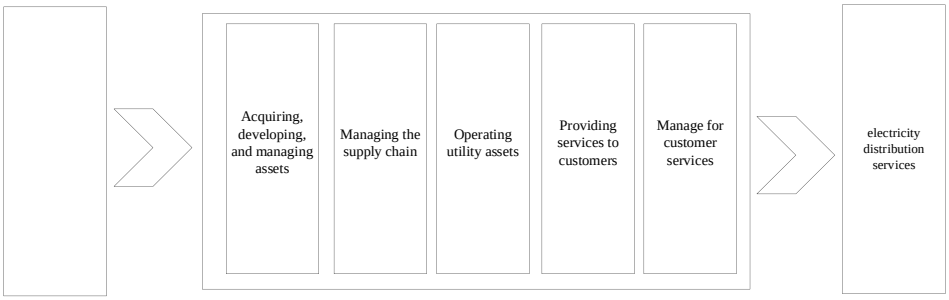

Figure 9 The scenario for process-output assessment

3.5.6 Input – Process – Output Assesment

The sixth scenario provides a comprehensive evaluation of the business process by considering inputs, processes, and outputs as an integrated system. This holistic approach assesses how inputs (RUPTL, RJPP, regulations, RKAP, and stakeholder expectations) interact with core processes to produce the desired outputs (electricity transmission services). By examining the entire value chain, this scenario ensures that all components are effectively aligned to achieve optimal performance and stakeholder satisfaction.

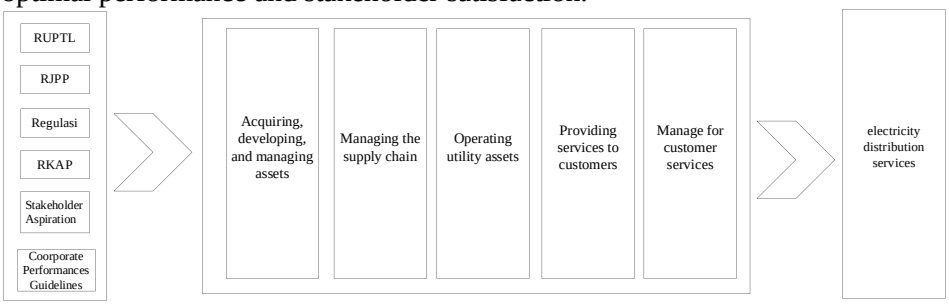

Figure 1 The scenario for input-process-output assessment

4 Conclusion

In conclusion, the development of a sustainability assessment model for transmission units is a critical step toward improving performance measurement at the operational level, which has been largely absent in PT PLN (Persero)'s current framework. By integrating sustainability considerations into business processes, the proposed model bridges the gap between operational activities and corporate objectives, ensuring alignment with the management contract. This

research lays a strong foundation through its literature review, field observations, and initial mapping of core business processes, enabling the creation of a conceptual framework tailored to the unique challenges and sustainability issues of the transmission unit. Furthermore, the model's alignment with existing regulatory guidelines and strategic documents ensures its relevance and applicability, providing a structured approach to evaluating inputs, processes, and outputs comprehensively. Future refinements and stakeholder engagement will strengthen the model's robustness, ultimately contributing to sustainable operational excellence within PT PLN (Persero).

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