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Asset Management Transformation in Energy Companies: Integration of ISO 55001, Balanced Scorecard, and SWOT Analysis for Competitive Advantage

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ABSTRACT: Asset management is a strategic component in ensuring the sustainability and operational efficiency of electric energy companies, especially in facing the challenges of increasing demand and the need for reliable electricity services. This article examines the implementation of ISO 55001 as a structured asset management system framework, with a Balanced Scorecard (BSC) approach as an integrated performance measurement tool from four perspectives: financial, customer, internal business processes, and learning and growth. The research was conducted at an electric energy provider organization, by analyzing Key Performance Indicators data for 2022–2023. The results of the BSC measurement show positive trends, such as increasing ROI, EBITDA Margin, Customer Satisfaction Index, and human capital readiness, but also reveal weaknesses such as the still high ratio of power outages and Equivalent Forced Outage Rate (EFOR). SWOT analysis is used to identify internal factors (strength and weakness) and external factors (opportunity and threat). Quantitative SWOT results show that the company is in quadrant I (aggressive strategy), with internal strengths and external opportunities dominating. Based on these findings, alternative strategies are formulated that are adjusted to each BSC perspective and ISO 55001 pillars (Cost, Performance, Risk). Strategies include optimizing asset life cycles, reducing maintenance costs, increasing distribution system reliability, and developing Human Resource capabilities. The integration of ISO 55001 and BSC has been proven to provide a holistic approach in designing data-based and risk-based strategies. These findings not only provide theoretical contributions to the development of modern asset management systems, but are also practically relevant for corporate policy makers in improving the efficiency, reliability, and competitiveness of organizations in the energy sector.

KEYWORDS: Asset Management ISO 55001, Balanced Scorecard, Key Performance Indicator, SWOT, Electricity Company

INTRODUCTION

The energy business plays a vital role in several sectors of the global economy (Brzoska et al., 2022). The quality of electricity distribution is an important factor for industrial competitiveness and public welfare (Luqman et al., 2021). As the demand for electricity increases, studies for its production are being developed (Kabak and Tas¸kÿnoz, 2020). According to estimates by the US Energy Information Administration, by 2050, there will be an increase of about 50% in the use of electricity worldwide (EIA, 2019). Asset management has become an important pillar in ensuring the sustainability of services of companies that manage public infrastructure, including in the electricity sector. This requires efficient asset management in electricity supply companies to be able to provide reliable, economical, sustainable services and create more value for consumers. (Rigo et al., 2022) .

In the era of digital and industrial transformation, the success of asset management no longer solely depends on tangible assets, but also on the optimization of intangible assets such as human competencies, information systems, and organizational structures. The World Bank notes that 77% of global economic value comes from intangible assets. Therefore, electricity service providers need to focus on a holistic asset management system that is integrated with the company's strategy.

To ensure efficient asset management, it is important for organizations to have an integrated performance measurement tool. Balanced Scorecard (BSC) is a strategic management tool that helps measure organizational performance from multiple perspectives, including financial, customer, internal processes, and learning and growth. It is necessary to identify the most critical assets, especially those that directly impact customer service and operational continuity. Critical assets must be prioritized in management to ensure that the risk of failure is minimized and maintenance costs can be optimized. ISO 55001 emphasizes the management of risks associated with assets. These risks can be infrastructure failures or operational disruptions that directly impact customer service. By using ISO 55001, organizations can identify these risks and plan appropriate mitigation actions.

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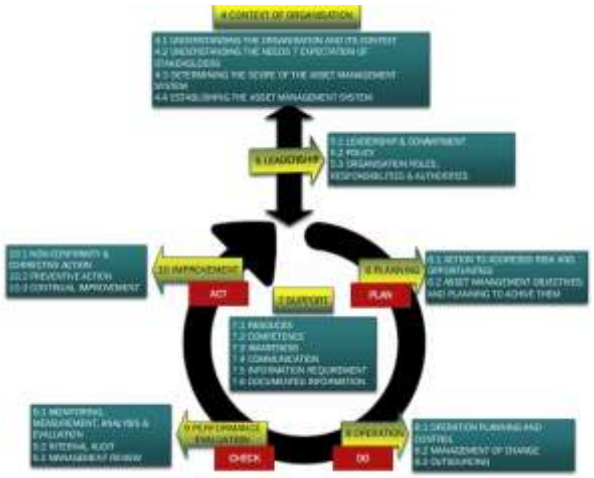

Figure 1 PDCA scheme in ISO 55001

The entire asset life cycle is managed optimally and sustainably ISO 55001 provides a structured framework for planning, operating, monitoring and improving asset performance with a risk-based approach. To ensure the effectiveness of the implementation of the system, The organization adopts a Balanced Scorecard (BSC) approach designed based on Key Performance Indicators (KPIs). The Balanced Scorecard allows organizations to evaluate performance from four perspectives. finance, customers, internal business processes, and learning and growth to drive alignment between the organization's vision and operational actions. As a complement to the development of performance improvement strategies, SWOT analysis is also used to identify strengths, weaknesses, opportunities, and threats in asset management. By integrating these three approaches, organizations can design data-driven strategies that not only strengthen asset management capabilities but also improve their competitiveness and operational resilience in the long term.

Based on the background, the formulation of the problem in this study is how the results of the application of the Balanced Scorecard in designing strategies based on Key Performance Indicators in the organization and How to plan a strategy to improve asset management performance with the ISO 55001 approach in the organization. Implementation of good asset management in the organization, by utilizing ISO 55001 and the Balanced Scorecard, will ensure the sustainability of operations and reliability of electricity supply. Efficient management of critical assets will reduce service disruptions and increase customer satisfaction, which will ultimately increase the competitiveness of the organization. The purpose of this study is to analyze the application of the Balanced Scorecard in developing a corporate strategy that is aligned with the organization's vision and mission, and to formulate an effective asset management improvement strategy with the ISO 55001 approach to support the achievement of the company's long-term goals.

By integrating ISO 55001 with the Balanced Scorecard in the approach used to ensure that asset management is not only optimized in terms of operations but also supports the achievement of the organization's strategic goals. Overall, this study presents a multidimensional approach to measuring and improving asset performance. With a focus on asset performance measurement and risk factor identification, this study is expected to provide theoretical contributions in the development of an asset management model based on the integration of ISO 55001 and Balanced Scorecard. On the practical side, the results of this study can be used as a strategic reference for organizational management in designing policies and work programs that support increasing the efficiency and reliability of electricity distribution services and provide valuable insights into how good asset management can drive overall organizational performance.

METHOD

1. Asset Management

Asset management is the science and art of managing assets, including planning, acquisition, inventory, implementation, audit, evaluation, operation, maintenance, updating or depreciation of assets, and their management effectively and efficiently (A. Gima Sugiama, 2013). Asset management is a coordinated activity carried out by an organization to realize

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the value of its assets (Cahyo, 2019). Asset management is essentially the management of assets in such a way that it can provide the greatest possible benefits at the lowest possible cost and will not be lost unless the asset is destroyed or written off (Ria Asih Aryani Soemitro & Supriyatno, 2018).

To achieve the goal of asset management through balancing costs, performance, and risk must be supported by a solid foundation (fundamental). There are four fundamentals of asset management, namely: 1. Value 2. Alignment 3. Leadership 4. Assurance

2. ISO 55001

ISO 55001 is an international standard published by ISO which can be used as a reference for organizations that will implement an asset management system (Asset Management System). According to ISO 55000: (2014a) the definition of asset management is "coordinated activities of an organization to realize value of their asset", or can be translated as "coordinated activities of an organization to realize the value of its assets" . The process of realizing the value of assets in a company/organization will generally involve balancing costs, risks, opportunities, and performance of the assets.

House of Asset Management (HAM) is illustrated as a house with a roof that represents the goal of asset management, namely realizing (realizing) the value of assets. To be able to support the achievement of this goal, it is supported by three pillars, namely: Cost, Performance, and Risk.

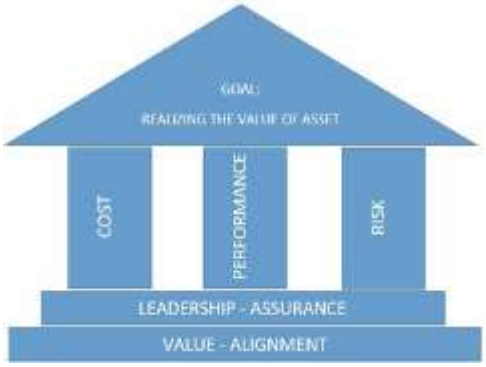

Figure 2 House of Asset Management (HAM) v.1

According to ISO 55000 (2014a), the process of achieving asset management objectives includes and must consider the balance of costs, performance, and risks of assets. Therefore, these three factors are used as pillars of the House of Asset Management (HAM). These three pillars must have the same burden and balance. If one pillar is smaller than the other or higher than the other, then this balance cannot be achieved and the process of achieving asset management objectives will not be optimal.

3. Balanced Scorecard

Balanced scorecard is an instrumentation system for business actors to control the organization in order to translate the organization's vision and mission into a strategic measurement framework for a set of parameters in each comprehensive perspective, so that it can improve the company's work ability to create sustainable competitive advantage in competitive conditions (Alimudin et al., 2019). In the balanced scorecard there are four perspectives, the following are the balanced scorecard perspectives.

- The Financial Perspective aims to evaluate the success of the organization in creating value for shareholders. The main focus of this perspective is profitability, revenue growth, cost efficiency, and return on investment. Financial indicators are a benchmark for the success of the strategy implemented from all aspects of the business.
- Customer Perspective, which assesses the extent to which an organization is able to meet the needs and expectations of its consumers. The goal of this perspective is to increase customer satisfaction and loyalty, which ultimately supports business growth and sustainability. The focus includes customer perceptions of product or service quality, speed of service, customer relationships, and market share.
- Internal Business Process Perspective, which aims to ensure that the company's internal processes run efficiently and

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effectively to provide value to customers and shareholders. The focus of this perspective includes product innovation, efficiency of production or service processes, quality control, and development of products and services that meet market needs.

- Learning & Growth Perspective, which is the foundation for long-term strategic sustainability. This perspective aims to improve organizational capabilities through employee competency development, an organizational culture that supports innovation, and the use of information technology. The focus is on human resource training and development, job satisfaction, and organizational readiness to face change.

4. Key Performance Indicators (KPI)

Key Performance Indicator (KPI) is a variable used to quantitatively express the effectiveness and efficiency of a process or operation based on the organization's targets and objectives as a tool to assess the success of achieving the organization's objectives which are manifested in certain measurements (Arlina, et al 2019) Key performance indicators will be a tool to measure organizational performance and ensure the alignment of the organization's vision and strategy. The results of the Key Performance Indicator achievement can also be used as an effective performance measurement tool for managers in providing annual performance assessments for all engineers and avoiding subjective assessments such as those currently running (Rokhim, 2017).

5. SWOT (Strengths, Weaknesses, Opportunities, Threats)

SWOT is used to evaluate strengths, weaknesses, opportunities and threats in a company by identifying factors internal and external support and hinder in achieving corporate objectives (Mintzberg, Ahsitrand & Lampel, 1998). The definition of SWOT can be described as follows (Hitt, Hoskisson, & Ireland, 2008):

- S (Strength) is obtained by knowing the strength of the organization, in terms of This can be interpreted as a favorable condition for the organization. the
- W (Weakness) namely by knowing the weaknesses of the organization that can be interpreted as a condition that is detrimental to the organization
- O (Opportunity) namely by knowing the opportunities of the organization interpreted as something that can be profitable if done, However, if this is not done, it could be detrimental to the company.
- T (Threat) namely by knowing the threats to the organization, namely things which can hinder or threaten the continuity of the organization.

RESULTS AND ANALYSIS

1. Vision and Mission of the Organization

The vision of the organization is to become a Global Top 500 Company and #1 Customer Choice for Energy Solutions. While the mission of the organization is to run an electricity business and other related fields, oriented towards customer satisfaction, company members and shareholders. Make electricity a medium to improve the quality of people's lives. Strive for electricity to become a driver of economic activity. Carrying out environmentally conscious business activities.

2. Organizational Objectives

The purpose of the organization is to organize the business of providing electricity for the public interest in sufficient quantity and quality and to generate profits and carry out government assignments in the electricity sector in order to support development by implementing the principles of a Limited Liability Company.

3. Organizational Business Process

A business process is all the activities carried out by a company. organization to create or distribute products in the form of goods or services to customers

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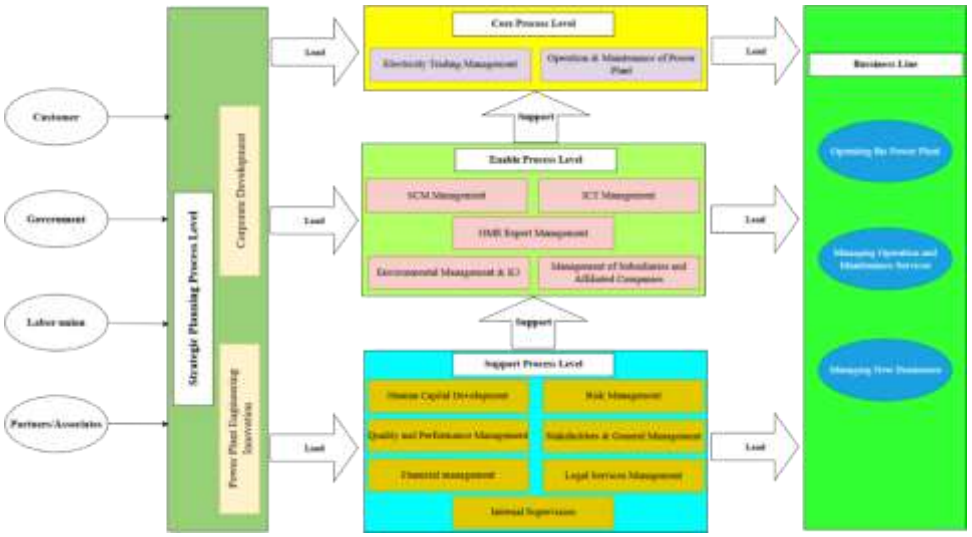

Figure 3 Company Business Process

4. Balanced Scorecard Data

- **Financial Perspective**

  Here is a perspective Finance from the Balanced Scorecard (BSC) for 2022 and 2023. Perspective Finance focuses on measuring the financial performance of an organization to determine the extent to which the strategies implemented contribute to increasing value for shareholders or stakeholders.

Table 1 Financial Perspective

Performance Indicators	Unit	Weight	Target		Realization		Achievement		Mark	
			2022	2023	2022	2023	2022	2023	2022	2023
Non-Fuel Material Turnover	Time	5	2.1	2.5	2.89	3.48	137.6	139.2	6.9	7.0
Revenue Growth to Cost Growth Ratio	%	25	85.23	91.13	88.03	94.84	103.3	104.1	25.8	26.0
Return On Investment (ROI)	%	6	60	75.41	71.21	88.13	118.7	116.9	29.7	29.2
Effectiveness of Employee Costs on Business Profit	%	25	9.1	10.15	12	16.13	131.9	158.9	33.0	39.7
EBITDA Margin	%	25	4	4.52	4.12	4.66	103.0	103.1	15.5	15.5

Data processing to determine achievement is done by dividing the realization by the target then multiplying it by 100. Meanwhile, the final value is obtained by multiplying the weight by the achievement then dividing it by 100. One example is seen in the achievement of Non-Fuel Material Turnover.

Achievement (%) = (Realization / Target) × 100
= (2.89 / 2.1) × 100
= 137.6

Value = (Weight × Achievement) / 100
= (5 × 137.6) / 100
= 6.9

Likewise, this process applies to all indicators in the organization.

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- **Customer Perspective**
  The following is the Customer perspective of *the Balanced Scorecard* (BSC) for 2022 and 2023. In the BSC approach, the customer perspective focuses on how the organization creates value for customers in order to achieve competitive advantage and long-term strategic success.

Table 2 Customer Perspective

Performance Indicators	Unit	Weight	Target		Realization		Achievement		Mark	
			2022	2023	2022	2023	2022	2023	2022	2023
Customer Satisfaction Index (CSI)	%	25	80	82.5	82.4	86.3	103.04	104.61	25.76	26.15
Customer retention	%	25	82.5	86.4	85.7	89.9	103.88	104.05	25.97	26.01
New customer acquisition	%	20	80	83.4	82.3	86.6	102.88	103.84	20.58	20.77
Power Interruption Ratio (SAIDI & SAIFI)	Hours/ Customers	20	3	2.55	2.72	2.12	90.67	83.14	18.13	16.63
Customer service response time	Hours/ Customers	10	2	1.83	1.92	1.63	96.00	89.07	9.60	8.91

- **Internal Business Process Perspective**
  The following is the Internal Business Process perspective of the Balanced Scorecard (BSC) for 2022 and 2023 which uses a number of key indicators that reflect the level of reliability and operational efficiency of the power plant. The Internal Business Process perspective focuses on how the company runs its business operations efficiently and effectively to meet customer needs and achieve company goals.

Table 3. Internal Business Process Perspective

Performance Indicators	Unit	Weight	Target		Realization		Achievement		Mark	
			2022	2023	2022	2023	2022	2023	2022	2023
Equivalent Availability Factor (EAF).	%	25	91.73	94.85	93.42	96.82	101.84	102.08	25.46	25.52
Equivalent Availability Factor (EAF) of Coal Power Plants	%	20	90.14	93.87	93.56	97.72	103.79	104.10	20.76	20.82
Equivalent Forced Outage Rate (EFOR).	%	25	2.5	2.5	3.56	3.39	142.40	135.60	35.60	33.90
Corporate Thermal Efficiency	%	20	2.51	2.32	2.45	2.25	97.60	96.98	19.52	19.40
Sudden Outage Frequency (SdOF)	Times/ Unit	25	3.25	2.58	3.55	3.2	109.23	124.03	27.31	31.01

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- **Learning & Growth Perspective**
  The following is the Learning and Growth perspective of the Balanced Scorecard (BSC) for 2022 and 2023. The Learning and Growth perspective focuses on how companies develop employee skills and knowledge, and create a work environment that supports innovation and continuous improvement.

Table 4. Internal Business Process Perspective

Performance Indicators	Unit	Weight	Target		Realization		Achievement		Mark	
			2022	2023	2022	2023	2022	2023	2022	2023
Human Capital Readiness (HCR)	Level	2	4	5	4	5	100	100	2	2
Organizational Capital Readiness (OCR)	Level	2	4	4.25	4.22	4.56	105.50	107.29	2.1	2.1
Informational Capital Readiness (ICR)	Level	2	4	4.5	4.34	4.89	108.50	108.67	2.2	2.2
Employee Engagement Index	%	3	80	90	86.25	97.63	107.81	108.48	3.2	3.3
Human Capital Readiness (HCR)	Level	2	4	5	4	5	100	100	2	2

5. SWOT Analysis

The results of the research that has been conducted show that the company has strength factors including a high value of *Equivalent Availability Factor* (EAF) indicating the availability of reliable generators to support electricity supply. In addition, high thermal efficiency reflects optimal energy management and operational cost savings. Not only that, a significant decrease in the frequency of sudden outages (SdOF) indicates an increase in the reliability of the electricity distribution system. Other strength factors of the company are optimal electricity trading management that contributes to increased revenue and customer satisfaction, thereby increasing the EBITDA margin which shows the efficiency of cost management and increased financial performance of the company, not only that, the high *Return on Investment (ROI) value reflects success in investment management and business strategy in* the organization's work area.

Meanwhile, the weakness factors owned by the company based on the results of this study are that there are still distribution disruptions in several areas, which have an impact on the continuity of electricity services to customers and electrification in remote areas is still low, indicating challenges in reaching all levels of society. In addition, the company still has weaknesses in its dependence on fossil-based energy supplies which are still high so that it can pose risks to sustainability and energy security. Not only that, the generation of *the Equivalent Forced Outage Rate (EFOR)* value which is still high indicates the need to increase the operational reliability of the generating machine. Another weakness factor of the company is that risk management in all work units is not optimal, thus creating the potential for unpreparedness for internal and external threats.

From the results of the research that has been conducted, it is known that there is a questionnaire given to the organization related to the weighting of internal factors and the weighting of the rating of each internal factor. So that the score of each internal factor can be known which includes *strength* and *weakness*. The total score value shown in the strength factor is 2. While the total score value shown in the weakness factor is 1.4 where both total scores from this study are positive and the total score and *strength factor* are greater than the total score value in the *weakness factor*.

Part of the external factors in this study are the opportunity and threat factors or also known as EFAS (External Strategic Factors Analysis Summary). Based on the results of the research that has been conducted by the organization, it is known that there are *Opportunity* factors, including the increase in electricity needs from the community and the

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industrial sector, which are great opportunities for companies to expand their service reach and increase electricity sales. In addition, Full support from the government for the development of renewable energy opens up opportunities for companies to diversify energy sources sustainably. Not only that, companies also have opportunity factors in the development of clean energy technology and digitalization to improve operational efficiency and customer service quality. Other opportunity factors owned by the company are Customer Satisfaction Index high shows a positive image of the company, while also being an opportunity to maintain customer loyalty. Opportunities within the company to increase transparency and compliance through the implementation of the principles of *Good Corporate Governance* (GCG) and *Enterprise Risk Management* (ERM) are opportunities to increase stakeholder trust in the company.

Meanwhile, the threat factors that exist in the company based on research that has been carried out, namely uncertainty in government regulations and policies can have a direct impact on... planning and implementation of electricity projects. In addition, climate change and global environmental policies are serious challenges for operations, especially in reducing emissions and maintaining the sustainability of energy supplies. Not only that, other threat factors are the increase in fuel prices for fossil-based power plants that have the potential to increase operational costs and electricity rates for customers. Changes in consumer behavior that tend to switch to alternative energy and off-grid systems require companies to be more innovative in maintaining the relevance of their services. Internally, the challenge of meeting international standards such as *Malcolm Baldrige* and GCG can hinder the company's efforts to improve corporate governance and sustainability as a whole.

Based on the results of the calculations carried out on EFAS (*External Strategic Factors Analysis Summary*), it is known that there is a questionnaire filled out by the organization. This questionnaire includes weighting of each external factor and weighting to determine the rating value of each internal factor. From the two questionnaire results, the score value of each internal factor will be known. From the data processing, this study shows the total score value of the opportunity factor, which is 2.30. While the total score value of the threat factor *is* 1.15. So it is known that both total scores of the company's external factors are positive and the total score value of *the opportunity factor* is greater than the total score value of *the threat* factor.

6. SWOT Diagram

Based on the data processing that has been done previously, the following are the results of the Organization's SWOT diagram.

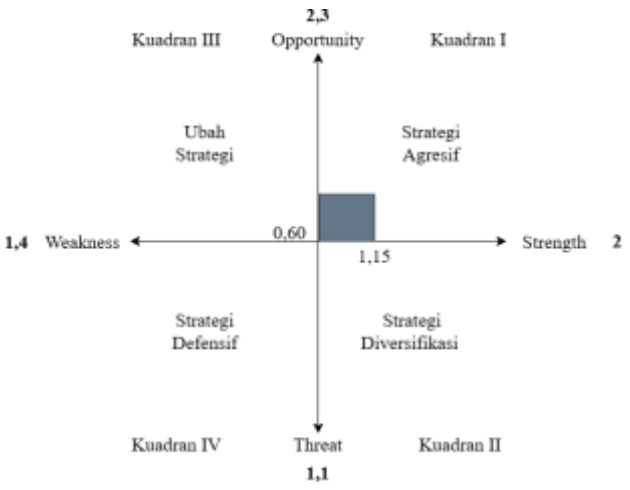

Figure 4 SWOT Diagram

Based on the results of the quantitative SWOT analysis of the strategic conditions of the organization, the coordinates of the strategic position on the SWOT diagram were obtained with a value of S - W = 0.6 for the horizontal axis (X) and O - T = 1.15 for the vertical axis (Y). This shows that the company's internal strength (Strength) is more dominant

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than its weaknesses (Weakness) with a difference of 0.6 points. On the other hand, external opportunities (Opportunity) are much greater than threats (Threat), with a value of 1.15 points. Value This illustrates that the company is in Quadrant I on the SWOT diagram, which is generally known as the aggressive strategy quadrant (*growth-oriented strategy*) **.** This position is a very profitable position because it shows that the company has strong internal resources and capabilities, and operates in an external environment full of opportunities. This means that the company has high capabilities and opportunities to develop further, expand the market, and improve the quality and efficiency of operations.

With this condition, the most appropriate strategy to be implemented by the organization is the SO (Strength-Opportunity) strategy**,** namely a strategy that utilizes the company's internal strengths to seize and optimize external opportunities. Some forms of aggressive strategies that can be implemented include expanding the coverage of electricity networks and services, utilizing government support to develop new and renewable energy (EBT) generators, and strengthening operational efficiency through the application of clean energy technology and digitalization of service systems. By optimizing its strengths such as high ROI, good thermal efficiency, and distribution system reliability, and combining them with major opportunities such as growing electricity demand and government policy support, the organization can secure its strategic position in the market and accelerate the transformation process towards a more modern, resilient, and sustainable electricity company.

7. Design of Asset Management Strategy Targets Based on ISO 55001

To be able to support the achievement of the objectives of the ISO 55001-based asset management system, organizations must align all asset management activities with three main pillars, namely Cost, Performance, and Risk**.** The three are the main foundations in the strategic decision-making process for assets.

Table 5. Balanced Scorecard and Iso 55001 Asset Management Integration

BSC Perspective	ISO 55001 Pillars	Related Strategies	Integration Explanation
Finance	Cost	• Optimizing ROI and EBITDA for renewable energy investments. • Controlling operational costs through thermal efficiency.	Reducing asset life cycle costs (LCC) through generation efficiency and financial allocation for distribution system improvements and digitalization.
Customer	Performance	• Increased CSI, new customer acquisition, and customer retention. • Acceleration of customer service response time. • Increased Equivalent Availability Factor (EAF).	Improved service and reliability of electricity supply drives customer satisfaction and loyalty and strengthens the organization's reputation.
Internal Business Process	Risk	• Decrease in EFOR and SdOF. • Modernization of distribution networks.	Manage operational reliability and reduce the risk of distribution disruptions through risk-based preventive maintenance planning and execution.

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Learning & Growth	Performance	• Improving asset management HR competency. • Building an organizational culture based on risk mitigation.	HR is equipped with the capability to understand cost analysis, assess technical risks, and make efficient strategic decisions in asset management.

The Relationship of Pillars with ISO 55001 Elements and *Balanced Scorecard*

1. *Cos*
   Integrated in *financial perspective* through maintenance cost management, energy efficiency, and strategic budget allocation. Related to clause 6 (Planning) and clause 8 (Operation) of ISO 55001.
2. *Performance*
   Supports customer perspective and internal business processes, with service targets, EAF, thermal efficiency, and CSI. Related to clause 9 (Performance Evaluation) of ISO 55001.
3. *Risk*
   Represents operational sustainability and compliance factors. Integrated in learning & growth and internal processes through technical and organizational risk mitigation systems. Related to clause 6 (Risk Planning), clause 9 (Evaluation), and clause 10 (Improvement) of ISO 55001.

8. Alternative Strategy

The formulation of strategies based on each Balanced Scorecard perspective is arranged systematically, by listing the sources of the strategies according to the research findings. This aims to ensure that each strategy proposed has a clear correlation to the actual conditions of the organization and can be used as a reference in formulating managerial policies and strategic planning in the future.

From a financial perspective, the strategy is directed at increasing the efficiency of asset maintenance costs through asset life cycle optimization and reducing unexpected damage costs. Allocating EBITDA margins to investments in new renewable energy. Reducing dependence on fossil fuels to suppress fluctuations in operational costs. Managing operational costs based on sustainable financial risk analysis. Leveraging thermal efficiency gains to reduce fuel costs.

From the customer perspective, the strategy focuses on improving service reliability by reducing the frequency and duration of outages caused by asset failures. An alternative strategy is to improve the speed and accuracy of customer service through digitizing the complaint system. Maintaining and improving CSI through customer loyalty based on reliable service. Adapting service models to consumer trends towards off-grid energy. Electrification of remote areas to reach new market segments. Speed up service and response to disruptions to maintain customer trust.

Furthermore, in the perspective of internal business processes, the strategy is focused on strengthening the asset management system through the implementation of asset management digitalization and maintenance information system integration. An alternative strategy is to utilize the high EAF to reach areas with high electricity needs. Revitalization of power plants to reduce EFOR values and increase system reliability. Implementation of smart grid and predictive monitoring to reduce sudden outages. Modernization of distribution systems to adapt to the challenges of climate change. Technology-based maintenance enhancements to strengthen network resilience.

From a learning and growth perspective, the strategy is directed at developing human resource competencies through technical and managerial training integrated with the asset management system. The main focus is to improve workforce readiness (Human Capital Readiness) and strengthen organizational culture based on continuous improvement

. The implementation of a knowledge management system is a supporting pillar to maintain the accumulation of technical knowledge that can be utilized across departments. Other strategies include increasing motivation and job satisfaction through incentive programs based on KPI achievement.

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CONCLUSION

1. *Balanced Scorecard* (BSC) method in organizations aims to measure and design strategies in an integrated manner based on four main perspectives, namely finance, customers, internal business processes, and learning and growth. In this study, *the Balanced Scorecard* is used to translate the company's vision, mission, and strategic objectives into the form of performance indicators (KPIs) that can be measured and evaluated. Each perspective in *the Balanced Scorecard* is analyzed starting from

   Financial Perspective highlighting *Return on Investment (ROI), cost management effectiveness, and increased revenue from distribution network efficiency*. *Data* shows improvements in sales productivity and customer connected power from 2021 to 2023. Then in the Customer Perspective, it is measured through *the Customer Satisfaction Index* (CSI), customer retention, power outage ratio (SAIDI & SAIFI), and customer service response time. It was identified that there were still indicators that had not met the target, namely the increase in the frequency and duration of power outages as the main challenge that had an impact on customer satisfaction and the handling of customer service response times which were still too long.

   In the Internal Business Process Perspective, indicators are used that focus on measuring performance on the effectiveness and efficiency of technical operations of the electricity system. The main indicators used include *Equivalent Availability Factor (EAF)*, *Equivalent Forced Outage Rate (EFOR)*, *Corporate Thermal Efficiency*, and *Shutdown Outage Frequency (SdOF)*. The findings show that the increase in contracted power has not been offset by an increase in network reliability, so that significant power outages still occur. The EFOR and SdOF indicators, which measure the level of forced disruptions, show performance that still requires attention and indicate that the frequency of major disruptions is still high and requires improvement of the risk management system. This indicates a weakness in the predictive and preventive maintenance system.

   Learning and Growth Perspective measured through *Human Capital Readiness* (HCR), *Organization Capital Readiness* (OCR), *Information Capital Readiness* (ICR) and *Employee Engagement Index*. Overall, in this perspective has been running effectively. the organization has succeeded in creating a work ecosystem that supports organizational learning, HR capacity development, and technology and information system readiness. This is an important foundation in strengthening the company's strategy and achieving long-term sustainability.
2. The strategy for improving asset management performance in an organization is designed based on the systematic approach of ISO 55001 which emphasizes the asset life cycle, risk assessment, and evidence-based decision *making*. Through the collection of operational data such as EFOR (Equivalent Forced Outage Rate) and SdOF (Shutdown Outage Frequency), it was found that distribution system disruptions were the main constraints in service reliability. This was reinforced by the identification of the root causes of system failures and operational losses.

   Strategic Planning is contained in Clause 6 of ISO 55001 formulated by considering the risks and opportunities identified in the SWOT analysis, then developed in the form of alternative strategies (SO, WO, ST, WT) that are in line with the company's internal and external conditions. WO and ST strategies are the dominant choices considering that the company faces technical challenges and customer service pressures. The ISO 55001 strategy is then integrated into the Balanced Scorecard perspective to ensure the success of the overall implementation. The designed strategy is evaluated through the KPIs that have been determined, supported by a periodic monitoring system. This aims to ensure that each improvement plan can be measured, followed up, and adjusted continuously in accordance with clauses 9 and 10 of ISO 55001.

SUGGESTION

To improve the effectiveness of asset management, organizations are advised to develop a risk-based monitoring system and predictive technology. Conduct periodic KPI evaluations and adjustments to align with operational dynamics. Improve HR competency through ISO 55001 training and risk management. Develop long-term strategies based on SWOT analysis results, especially aggressive Strength and Opportunity strategies. Conduct regular internal audits to ensure alignment of strategy and performance. And strengthen collaboration with regulators and stakeholders to support the sustainability of electricity services.

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