BRIDGING THE GAP BETWEEN STRATEGIC TARGETS AND OPERATIONAL FEASIBILITY: AHP-BASED KPI OPTIMIZATION IN PT BUKIT ASAM TBK

MENJEMBATANI KESENJANGAN ANTARA TUJUAN STRATEGIS DAN KELAYAKAN OPERASIONAL: OPTIMALISASI KPI BERBASIS AHP DI PT BUKIT ASAM TBK

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ABSTRACT
This research aims to bridge the gap between PT Bukit Asam Tbk's strategic targets and its operational feasibility by optimizing Key Performance Indicators (KPIs) within the company's Balanced Scorecard (BSC). Using the Analytic Hierarchy Process (AHP), this research prioritizes internal perceptions of KPI importance across the four BSC perspectives: Financial & Market, Customer Focus, Internal Business Process, and Learning & Growth. Interviews and AHP-based pairwise comparisons reveal that several KPIs currently in use do not reflect PTBA's internal strategic priorities. Additionally, the Traffic Light System (TLS) is introduced to assess performance realization and validate the feasibility of target setting. The results suggest that the most favored alternative is refining KPI targets rather than changing its components or weight. This approach not only improves alignment between internal and external expectations but also enables more realistic and measurable performance evaluation. The findings are expected to serve as a foundation for PTBA's strategic dialogue with MIND ID and for broader KPI governance improvements.
Keywords: *The Balanced Scorecard, Analytical Hierarchy Process, Traffic Light System, Key Performance Indicator, Strategic Alignment.*

ABSTRAK
Penelitian ini bertujuan untuk menjembatani kesenjangan antara target strategis PT Bukit Asam Tbk dan kelayakan operasionalnya dengan mengoptimalkan Indikator Kinerja Utama (IKU) dalam Balanced Scorecard (BSC) perusahaan. Menggunakan Proses Hierarki Analitis (AHP), penelitian ini memprioritaskan persepsi internal mengenai pentingnya KPI di empat perspektif BSC: Keuangan & Pasar, Fokus Pelanggan, Proses Bisnis Internal, dan Pembelajaran & Pertumbuhan. Wawancara dan perbandingan berpasangan berbasis AHP menunjukkan bahwa beberapa KPI yang saat ini digunakan tidak mencerminkan prioritas strategis internal PTBA. Selain itu, Sistem Lampu Lalu Lintas (TLS) diperkenalkan untuk menilai realisasi kinerja dan memvalidasi kelayakan penetapan target. Hasil menunjukkan bahwa alternatif yang paling disukai adalah menyempurnakan target KPI daripada mengubah komponen atau bobotnya. Pendekatan ini tidak hanya meningkatkan keselarasan antara harapan internal dan eksternal tetapi juga memfasilitasi evaluasi kinerja yang lebih realistis dan terukur. Temuan ini diharapkan menjadi landasan bagi dialog strategis PTBA dengan MIND ID dan perbaikan tata kelola KPI secara lebih luas.
Kata Kunci: Balanced Scorecard, Analytical Hierarchy Process, Traffic Light System, Key Performance Indicator, Strategic Alignment.

INTRODUCTION

Indonesia's economy has shown significant growth in recent decades. After successfully overcoming economic crises, economic growth in Indonesia has continued to increase, making the country a middle-income nation, with an 5.03% increase of GDP, amounting up to Rp 22,139 trillion in 2024 (BPS, 2025). The increasingly competitive business landscape has also intensified competition among companies across various industries. One of the industries experiencing such competition is the coal mining industry.

The significant growth of the global coal market in recent years has been driven by the increasing energy demand in several developing countries, particularly in the heavy industry sector. As one of the world's largest coal exporters, Indonesia plays a major role in

meeting global energy needs. One of Indonesia's largest coal mining companies, PT Bukit Asam Tbk, recorded a coal production of 37 million tons in 2023, an increase of 10% compared to 2022 (PT Bukit Asam Tbk, 2023). Meanwhile, PT Adaro Energy Indonesia Tbk reported a coal production of 62 million tons in 2023 (Adaro Energy Indonesia, 2023). Additionally, PT Kaltim Prima Coal (KPC) achieved an annual coal production of 70 million tons (Kaltim Prima Coal, 2023).

However, in practice, fluctuations in global coal prices and regulatory policy changes, such as the implementation of a 25% Domestic Market Obligation (DMO), impact mining companies in balancing market demand with domestic obligations (Ministry of Energy and Mineral Resources, 2023). To establish effective performance management, ensure operational stability, and enhance corporate competitiveness in the global market, appropriate approaches and evaluations are necessary (Hartini & Habibi, 2023).

The Balanced Scorecard (BSC) is one of the methods that can measure both financial and non-financial performance of a company. It evaluates corporate performance from four perspectives: financial, customer, internal business processes, and learning and growth (Kaplan & Norton, 1992). In performance measurement, the implementation of the Balanced Scorecard (BSC) can be supported by the use of Key Performance Indicators (KPI) to communicate a company's vision and mission, strategy, values, and objectives through predefined performance indicators (Azzahra et al., 2024). However, there are difficulties in quantifying qualitative aspects like employee satisfaction or corporate culture, and the complexity of aligning

different departments with strategic objectives. Therefore, in corporate performance measurement using the Balanced Scorecard (BSC), AHP is applied to determine weighting factors (Hermanto, 2023).

The Analytic Hierarchy Process (AHP) is a method introduced by Saaty in the 1970s. It has since become a decision-making approach that incorporates both objective and subjective considerations, offering broad applicability and efficient use for various types of decision-making problems (Marpaung et al., 2022). As a decision-support method, AHP breaks down complex multi-factor and multi-criteria problems into a hierarchical structure.

PT Bukit Asam Tbk (PTBA) was officially established on May 2, 1981, based on Government Regulation No. 42 of 1980 concerning the Capital Participation of the Republic of Indonesia for the Establishment of the State-Owned Coal Mining Company Bukit Asam. The company was listed on the Indonesia Stock Exchange (IDX) and was subsequently recorded in Notarial Deed No. 18 dated October 14, 2002, under the stock code PTBA.

In 2017, PT Bukit Asam Tbk (PTBA) joined the State-Owned Mining Holding led by PT Indonesia Asahan Aluminium (Persero). Later, in 2023, PTBA formed the State-Owned Holding Company for the Mining Industry under the name PT Mineral Industri Indonesia Persero (MIND ID), which became the parent company for PT ANTAM Tbk, PT Bukit Asam Tbk, PT Timah Tbk, and PT Asahan Aluminium.

In executing its business processes, PT Bukit Asam Tbk (PTBA) implements a balanced scorecard (BSC) performance management system, which consists of several key performance indicators (KPI) to ensure the achievement of predetermined targets. In this regard,

PTBA sets corporate KPI targets that are 100% aligned with the management contract of PTBA's Board of Directors, as established by MIND ID.

PTBA implements 24 KPI indicators, which are categorized into four perspectives: Financial & Market, Customer Focus, Internal Business Process, and Learning & Growth. The KPIs implemented at PTBA may change annually, aligning with the contract set by MIND ID. In 2024, the KPI with the highest weighting is the Financial Ratio Target Achievement, followed by Total Coal Sales.

From a business process perspective, PTBA's core activities throughout its supply chain primarily involve coal transportation and sales. However, these two indicators are not always included in the company's performance measurement. Over the past five years, there have been certain years where these activities were not incorporated into the KPI framework, as shown in the following table of coal transportation volume:

Table 1. Coal Transportation Volume 2020-2024

Year	Target	Realization
2020	23.001.001	23.797.616
2021	28.200.000*	25.418.964
2022	31.500.000	28.811.173
2023	32.000.000*	32.419.177
2024	33.692.500*	35.431.526

Note: *not included as targets in PTBA's BSC KPIs.

From the table, it can be seen that coal transportation only met its target in 2020, 2023, and 2024, even though it was included as a KPI target in 2022. A similar pattern can be observed for coal sales volume. Below is the data of coal sales volume for year 2020 until 2024:

Table 2. Coal Sales Volume 2020-2024

Year	Target	Realization
2020	24.855.889	26.124.876
2021	29.800.000*	27.593.090
2022	36.200.000	30.813.929
2023	40.204.800*	35.911.987
2024	43.113.700	42.890.977

Note: *not included as targets in PTBA's BSC KPIs.

The table above shows that coal sales volume only met its target in 2020. Although it was included as a target in PTBA's Balanced Scorecard (BSC) for 2022 and 2024, it still fell short of expectations. These findings indicate that despite being part of the BSC, both coal transportation and sales activities failed to meet their targets in certain years. Additionally, the weight assigned to these indicators suggests that they are not considered top priorities in PTBA's BSC.

PTBA's Balanced Scorecard is fully aligned with the contractual agreements set by MIND ID without any internal adjustments, raises the need to reassess whether the current KPI structure adequately reflects PTBA's internal priorities and operational realities, ensuring that performance measurements are both strategic and feasible.

METHOD
Research Design

The research design is shown in the picture below, it encompasses the key stages of the research process, including problem identification, data collection methods, and analytical techniques. This framework serves as the foundation for addressing the research objectives and questions. Figure 1 below illustrates the research design used in this study.
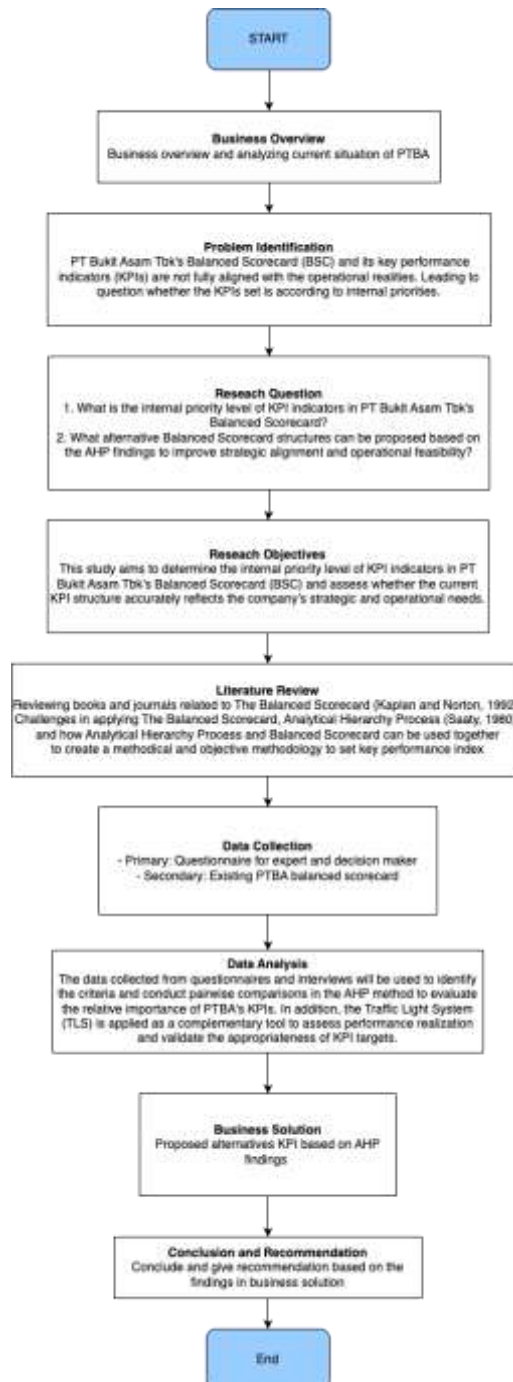

Figure 1. Research Design
(Source: Author's Analysis)

Figure 1 illustrates that this study answers the research objectives and questions through a mixed-methods approach. Qualitative research mainly uses interviews, focus groups, and case studies method to collect narrative data

for (Lee, 2024). By employing interactive and adaptable techniques, it seeks to investigate participants' viewpoints and offer a comprehensive comprehension of behavior, perception, motivation, and decision-making (Haki & Prahastiwi, 2024). The qualitative approach will be employed in this study to learn more about managers' opinions regarding the current KPIs, potential areas for development, and important indicators that ought to be considered in the AHP analysis.

Focused on numerical data analysis, quantitative research is a methodical process meant for recognizing trends, connections, and patterns. To ensure objectivity and consistency, it gathers quantifiable data using organized instruments like surveys, tests, and statistical analyses. This reseach applies the Analytical Hierarchy Process (AHP) to assess the Key Performance Indicators (KPIs) in PTBA's Balanced Scorecard (BSC). AHP is a multi-criteria decision-making tool that converts expert opinions into numerical weights thereby enabling a systematic KPIs prioritizing (Saaty, 2008), therefore quantitative method is suitable for this research.

Data Collection Method

The primary data in this study will be gathered by using a questionnaire and interview addressed to PTBA's decision-makers and experts in the field. While the interviews are intended for in-depth conversations and insights into the KPIs and sub-criteria that should be given top priority, the questionnaires will be used to acquire structured information for AHP judgements. Understanding the expert viewpoints regarding choosing and improving the sub-criteria for the Analytic Hierarchy Process (AHP) depends on these interviews. This will ensure that the research includes

expertise from those personally engaged in KPI preparation and performance assessment. PTBA refers to the contract structure established by MIND ID in forming the BSC. PTBA does, however, also have an internal department in charge of organizing and refining the BSC to fit its operational and strategic demands.

The AHP technique will be used to assess the relevance of every BSC perspective and indicator through the use of the collected expert opinions. This method guarantees that the weighting represents both strategic aims and operational viability, therefore enabling a quantitative evaluation of KPI priority.

RESULT AND DISCUSSION
Analysis

This research uses 27 respondents for the AHP analysis. The respondents were selected from various departments within PT Bukit Asam Tbk (PTBA) to ensure proportional representation across the organizational functions. This approach was adopted to capture a comprehensive perspective in determining the relative importance of each Balanced Scorecard (BSC) perspective and indicator. By incorporating insights from multiple departments, the results are expected to be more accurate and reliable as a basis for strategic decision-making within the company. The AHP calculation was conducted using an online software tool, bpmsg.com, which developed by Klaus D. Goepel to make more accurate computations and ensure that respondents fill out the pairwise comparisons with more consistency.

Financial & Market Perspective

There are five KPIs under this perspective; however, only four were included in the AHP analysis. The KPI "Maintaining the P/B Ratio" was

excluded based on preliminary interviews with key stakeholders involved in the development of the BSC. According to their input, this indicator should not be categorized under the financial and market perspective, but rather under the indicator "Maintaining Corporate Reputation". Stakeholders argued that the P/B ratio is heavily influenced by external factors, particularly investor confidence in PTBA, and therefore does not directly reflect internal performance.

Table 3. Financial and Market Perspective Decision Hierarchy Result

Level 0	Level 1	Priority
Financial and Market Perspective	Fulfillment of Financial Ratio Target	41.5%
	Reduction of Coal Cash Cost	35.8%
	Absorption of Non-Routine Investment	9.2%
	Contribution of EAT from Subsidiaries, Joint Ventures & Associated Companies	13.5%
		1.0

Based on the results of the AHP calculation, the KPI "Achievement of Financial Ratio Targets" holds the highest weight at 41.5%, while the KPI "Absorption of Non-routine Investments" has the lowest weight among the four KPIs compared. In PTBA's 2024 BSC, the "Achievement of Financial Ratio Targets" also has the highest weight within this perspective. However, the KPI "Reduction of Coal Cash Cost", which was identified in the AHP analysis as having the second-highest priority, was instead assigned a lower weight than "Absorption of Non-routine Investments" which has the lowest rank in the AHP results. This discrepancy highlights a misalignment between PTBA's internal assessment of strategic priorities and the perspective of MIND ID, the holding company responsible for setting the BSC framework for its subsidiaries. The result suggests that there may be differing views on KPI relevance and importance, which could affect the alignment between corporate strategy and operational execution. Here is the comparison between the result of AHP calculation and the existing BSC in PTBA.

Table 4. Financial and Market Perspective Comparison Summary

KPI	Weight in BSC	Weight in AHP	Alignment Status
Fulfillment of Financial Ratio Target	13%	41.5%	Aligned
Absorption of Non-Routine Investment	5%	9.2%	Overprioritized in BSC
Reduction of Coal Cash Cost	3%	35.8%	Underprioritized in BSC
Contribution of EAT from Subsidiaries, Joint Ventures & Associated Companies	5%	13.5%	Aligned

The table above illustrates some misalignments in weight of each KPI assigned by MIND ID to PTBA. Based on interviews with all relevant stakeholders, the KPI "Reduction of Coal Cash Cost" is considered to have a high level of importance, which is also in line with the results of the AHP analysis. From the interviews, stakeholders expressed that this KPI is crucial for two main reasons. First, the reduction of coal cash cost is something that can be fully controlled internally by the company. Second, it has a direct impact on the

company's profitability, such as EBITDA. Cost efficiency serves as a source of competitive differentiation, enabling the company to strengthen its position in the market therefore, this KPI should ideally be assigned a greater weight. However, in practice, as reflected in the official BSC, this indicator is given a relatively lower weight compared to the other KPIs.

After identifying the priority level of each KPI, alternatives were developed to align the Balanced Scorecard (BSC) with the internal priorities of the company. Three improvement alternatives were proposed for each KPI: modifying the KPI components, adjusting the KPI weight, and refining the measurement or target-setting method. The result of alternative analysis is presented in the table below:

Table 6. Alternative Improvement Strategies for Financial and Market Perspective

KPI	Modify Component	Adjusting Weight	Refine Target	Top Alternative
Financial Ratio Target	23.8%	30.1%	46.1%	Refine target
Coal Cash Cost Reduction	23.1%	35.8%	41.1%	Refine target
Absorption of Non-Routine Inv.	32.5%	19.5%	47.9%	Refine target
Contribution of EAT	36.9%	32.0%	31.0%	Modify component

The alternative results presented above show that respondents predominantly selected the refining target measurement methods for most KPIs within this perspective. Stakeholders emphasized that while these KPIs are relevant, they often lack clarity in how performance is measured, resulting in ambiguity in evaluating target achievement. This is consistent with the interview findings, where one respondent noted that although the targets for the financial ratio KPI are appropriate, they are sometimes set too ambitiously and are not aligned with market realities. For another KPI, a different respondent added that the measurement method for the coal cash cost reduction KPI could still be improved, particularly regarding which cost items are included in the calculation.

Only the KPI regarding the contribution of subsidiaries, joint ventures and associated companies to EAT was considered best addressed by

modifying the KPI component itself. This indicates that stakeholders believe the definition of the contribution in this KPI needs to be redefined, including how it is segmented by subsidiary. One respondent stated that the contribution of subsidiaries is not clearly defined and should specify the dimension from which the contribution is being measured.

To complement the AHP analysis, this research employed a Traffic Light System (TLS) to assess whether the target values currently used in the Balanced Scorecard are aligned with internal expectations. The same respondent for AHP analysis also were asked to define threshold values for each KPI that correspond to Red (low), Yellow (moderate), and Green (good or acceptable) zones. These inputs serve to validate the feasibility and clarity of performance targets from the perspective of internal stakeholders. The table below is the result of the TLS survey for each

of the KPI and its comparation to the realization.

Table 6. Traffic Light System for Financial and Market Perspective

KPI	Red		Yellow		Green		Realization
Fulfillment of Financial Ratio Target	8%	77%	78%	91%	92%	100%	95,99%
Absorption of Non-Routine Investment	0,92	1232,74	1250,21	1679,26	1685,18	2008,92	1.406
Reduction of Coal Cash Cost	1%	0%	-1%	-2%	-2%	-3%	-3,98
Contribution of EAT from Subsidiaries, Joint Ventures & Associated Companies	14,86	344,79	345,66	467,44	462,88	576,15	870

The performance review using this method shows that three out of four KPIs fall within the green zone, based on the threshold definitions provided by respondents. However, the "Absorption of Non-Routine Investment" KPI is categorized in the yellow or moderate achievement zone. Based on interviews with stakeholders, this underperformance is often not due to flawed strategy, but rather because certain projects were delayed or had not yet commenced. Therefore, the target refining alternative is the preferred alternative in the AHP analysis, could help PTBA set more realistic and achievable targets for this KPI

Customer Focus Perspective

There are only two KPIs under this perspective, and both were included in the AHP analysis to determine which indicator holds greater relative importance. The results of the AHP analysis clearly show that the majority of the respondents assigned a higher weight to the KPI "Commercial Analysis" with the weight of 65.6%, compared to the KPI "Maintaining Corporate Reputation".

Table 7. Customer Focus Perspective Decision Hierarchy Result

Level 0	Level 1	Priority
Customer Focus Perspective	Commercial Analysis	65.6%
	Maintaining Corporate Reputation	34.4%
		1.0

Based on the interview results, there is no clear indication that commercial analysis is significantly more important than maintaining corporate reputation. Respondents generally viewed both components as essential in supporting the company's long-term targets. Therefore, unlike the financial and market perspective, there is no KPI within this perspective that needs to be eliminated. The weight assigned by MIND ID in PTBA's BSC is also aligned with the AHP analysis results, where commercial analysis carries a slightly higher weight which emphasized that is already reflected in the official BSC.

The same method and steps were applied to this perspective. After analyzing the KPI priorities using AHP, the alternatives were then weighted according to each KPI. The following table presents the alternative analysis for the customer focus perspective.

Table 8. Alternative Improvement Strategies for Customer Focus Perspective

KPI	Modify Component	Adjusting Weight	Refine Target	Top Alternative
Commercial Analysis	36.3%	20.3%	43.3%	Refine target
Maintaining Company Reputation	28.7%	22.9%	48.3%	Refine target

Respondents viewed refining the target as the most suitable alternative for both KPIs within this perspective, as it better aligns with PTBA's long-term objectives and internal capabilities. These AHP alternative results are supported by stakeholder interviews, which emphasized the importance of refining how performance is measured for both customer related KPIs. One respondent highlighted that *"market analysis is necessary, but sometimes the result doesn't align with the pricing strategy"* which indicates that there is a gap between analysis and execution. This gap can be addressed through clearer, more actionable targets. Similarly, another stakeholder highlighted, *"reputation is important, but the target must be clear and not only using general index. It should be relevant to our industry,"* these findings indicate the need for more tailored and meaningful benchmarks in evaluating corporate reputation. These statements affirm that while the KPIs themselves are relevant, the refining target methods is key to improving alignment with internal strategic expectations.

This perspective also incorporates the Traffic Light System (TLS) method for performance evaluation. The following table presents a comparison between the TLS survey results and the actual KPI realization.

Table 9. Traffic Light System for Customer Focus Perspective

KPI	Red		Yellow		Green		Realization
Commercial Analysis	8%	75%	76%	90%	91%	100%	100%
Maintaining Company Reputation	29%	15%	16%	10%	9%	0%	1.61%

The performance review using this method showed that both KPIs demonstrated good achievement. For the "Maintaining Company Reputation" KPI, the threshold operates in reverse as it reflects negative publicity about the company, a lower score on this KPI actually indicates better performance.

Internal Business Process Perspective

This perspective has the most KPIs compared to the other Balanced Scorecard perspectives, with a total of 14 indicators. However, preliminary interviews with stakeholders revealed several issues, including redundancy and duplication among certain KPIs, the presence of low-impact indicators, as well as unclear and fragmented metrics. Several stakeholders also expressed that some KPIs could be combined or consolidated to better reflect strategic focus and reduce complexity in performance measurement.

There are two pairs of KPIs that stakeholders consider redundant and overlapping. First, the KPIs "Total Coal Sales" and "Unlocking Logistics" were viewed as closely related, as both aim to increase coal sales and optimize transportation capacity. Stakeholders argued that these KPIs could be merged,

as they form part of the same revenue-generation flow. Second, "Re-estimation of Resources & Reserves in IUP" and "Completion of IUP Extension Expiring in 2026" were also perceived as overlapping, as both address long-term resource availability and regulatory compliance. These were considered administrative distinctions that could be consolidated under a broader "Resource Sustainability" KPI.

Stakeholders further noted that certain KPIs are not critical or are already reflected in other indicators, leading to suggestions for elimination. For example, the KPI "Reduction of Unscheduled Downtime" was seen as too narrow in scope, as its impact is already captured indirectly through output-based metrics such as production volume or capacity utilization. Similarly, the KPIs "Completion of Audit & Follow-up Matrix (MONEV)" and "Strengthening Risk Management

Implementation" were perceived as basic governance functions that do not require distinct KPI-level focus unless under exceptional circumstances. These governance activities are also interdependent and typically follow the same reporting cycles, potentially contributing to administrative inflation.

Lastly, stakeholders highlighted fragmentation and a lack of structure in innovation-related KPIs. Projects such as "Implementation of Innovation Results" and "EPC CHF & TLS TE-Kramasan Project Work" were scattered across multiple KPIs without a unified framework. Stakeholders recommended consolidating these under a single "Strategic Innovation and Development" KPI to enhance clarity and focus. Following these suggestions for elimination and consolidation, a total of eight KPIs from this perspective were selected for analysis using the AHP method.

Table 10. Internal Business Process Decision Hierarchy Result

Level 0	Level 1	Priority
Internal Business Process Perspective	HSS Excellence	10.9%
	Improving and Maintaining PROPER Gold & Green Rating	9.5%
	Total Coal Sales	24.0%
	Re-estimation of Resources & Reserves in IUP	12.9%
	Completion of 2024 Procurement Work Program	6.9%
	Optimization of IT Function	8.0%
	Innovation and development project	18.4%
	Reduction of Carbon Emissions Against BAU 2024 Total Emissions	9.3%
		1.0

The AHP results for the Internal Business Process perspective show that "Total Coal Sales" holds the highest priority weight at 24%, indicating it is considered the most important KPI within this perspective. This finding is consistent with the actual BSC

implemented by PTBA, where this indicator also carries a relatively high weight. In contrast, the "Completion of the 2024 Procurement Work Program" received the lowest weight based on the AHP analysis. However, in PTBA's current BSC structure, this KPI is

assigned a relatively significant weight compared to other indicators, suggesting a possible misalignment between internal stakeholder priorities and the formal KPI weighting set by the organization. Here is a table for AHP and BSC weight alignment comparison.

Table 11. Internal Business Process Perspective Comparison Summary

KPI	Weight in BSC	Weight in AHP	Alignment Status
HSS Excellence	5%	10.9%	Aligned
Improving and Maintaining PROPER Gold & Green Rating	3%	9.5%	Aligned
Total Coal Sales	10%	24.0%	Aligned
Re-estimation of Resources & Reserves in IUP	2%	12.9%	Underprioritized in BSC
Completion of 2024 Procurement Work Program	3%	6.9%	Overprioritized in BSC
Optimization of IT Function in Improving IT Service Quality & Supporting Operational Activities	3%	8.0%	Aligned
Implementation of Innovation Results (PTBA)	2%	18.4%	Underprioritized in BSC
Reduction of Carbon Emissions Against BAU 2024 Total Emissions	2%	9.3%	Underprioritized in BSC

The table above illustrates some misalignments in weight of each KPI assigned by MIND ID and PTBA's internal priorities These differences suggest that some indicators may be overemphasized or underrepresented relative to their perceived strategic importance by PTBA's internal stakeholders. Additionally, based on input gathered from stakeholder interviews, several KPIs have been either consolidated due to redundancy or eliminated due to limited relevance or impact. The next section will further explore how these selected KPIs can be improved through appropriate alternative actions.

Table 12. Alternative Improvement Strategies for Internal Business Process Perspective

KPI	Modify Component	Adjusting Weight	Refine Target	Top Alternative
HSS Excellence	38.6%	23.4%	38%	Modify component
Improving and Maintaining PROPER Gold & Green Rating	34.7%	25.9%	39.4%	Refine target
Total Coal Sales	25.6%	29.4%	45%	Refine target
Re-estimation of Resources & Reserves in IUP	31.9%	25%	43.1%	Refine target
Completion of 2024 Procurement Work Program	26.5%	32.4%	41.1%	Refine target
Optimization of IT Function in Improving IT Service Quality & Supporting Operational Activities	36.4%	28.6%	41.1%	Refine target
Implementation of Innovation Results (PTBA)	32.9%	26%	41.1%	Refine target
Reduction of Carbon Emissions Against BAU 2024 Total Emissions	28%	18.4%	53.6%	Refine target

Out of eight KPIs, only one KPI that the respondents feel that the best alternative is to the modify component, which is "HSS Excellence" and the other KPIs best alternative is to refine the target. The selection of refining target for most of the KPIs indicates that most internal KPIs are considered structurally appropriate and strategically relevant, but lack clarity, realism, or alignment in how performance success is defined or measured. In contrast, KPIs like HSS Excellence may require a more fundamental revision of the indicator's design, pointing to possible issues in scope or component definition. For example, the KPI "Total Coal Sales" viewed as one of the most essential KPI but in its process it is tightly linked to the company's logistic capacity, the stakeholder suggestion is to redefine the target or scope with the consideration of various factors and limitations.

This analysis will also be complemented by performance evaluation using Traffic Light System (TLS) method, below is the result for TLS analysis for internal business process perspective.

Table 13. Traffic Light System for Internal Business Process Perspective

KPI	Red		Yellow		Green		Realization
HSS Excellence	14%	77%	78%	91%	92%	100%	60%
Improving and Maintaining PROPER Gold & Green Rating	0 Gold, 1 Green	1 Gold, 1 Green	1 Gold, 1 Green	2 Gold, 2 Green	1 2 Gold, 1 Green	1 3 Gold, 1 Green	2 Gold, 3 Green
Total Coal Sales	9	35	36	40	41	46	43
Re-estimation of Resources & Reserves in IUP	13%	75%	76%	90%	91%	100%	100%
Completion of 2024 Procurement Work Program	13%	76%	77%	90%	91%	100%	98,5%
Optimization of IT Function in Improving IT Service Quality & Supporting Operational Activities	12%	77%	78%	90%	91%	100%	100%
Implementation of Innovation Results (PTBA)	11%	75%	76%	90%	91%	100%	100%
Reduction of Carbon Emissions Against BAU 2024 Total Emissions	0%	1%	1,1%	2%	2,1%	3%	7,7%

Based on the performance evaluation, the KPIs in this perspective generally has achieved a good performance except for "HSS Excellence" which has poor performance according to the survey threshold result. The "HSS Excellence" KPI actually has a relatively high weight in the BSC, and in the AHP analysis, it ranked fourth in terms of priority weight. This is further supported by interview findings, which consistently emphasized that the "HSS Excellence" component is highly important, particularly in the context of PTBA's high-risk coal mining operations. However, in 2024 a fatality occurred, which significantly impacted the KPI's performance score, causing a 40% drop in the achievement rate. If detailed, the HSS Excellence KPI already consists of dozens of parameters aimed at preventing accidents. However, this sharp decline indicates a limitation in how the current KPI component is structured, as it does not sufficiently

capture the breadth of ongoing safety initiatives**.**

Learning and Growth Perspective

In this perspective, there are three KPIs: "Talent Management Optimization", "Implementation of the Pension Fund Recovery Roadmap", and "Improvement of All Productivity Metrics Compared to the Previous Year". The KPI "Pension Fund Recovery Roadmap" was considered less relevant by the majority of respondents. Some noted that the program is still in the conceptual stage and has not been implemented concretely, making it difficult to measure objectively. Furthermore, its impact is perceived as indirect to the company's operational performance and is more related to long-term financial issues that lie beyond the control of the core operational units. As a result, this KPI was excluded from the AHP analysis for this perspective.

Table 14. Learning and Growth Decision Hierarchy Result

Level 0	Level 1	Priority
Learning and Growth Perspective	Optimization of Talent Management	51.2%
	All Productivity Metrics Better Than Previous Year	48.8%
		1.0

Based on the AHP analysis, the "Talent Management" KPI received a slightly higher weight compared to the "Productivity Metrics" KPI. However, in the current BSC structure, the Productivity KPI is assigned a greater weight.

This discrepancy is supported by several interviewees who emphasized the strategic importance of talent management as a foundational element of the company, particularly in the context of organizational transformation and workforce regeneration. Meanwhile, productivity metrics are seen as not always reflecting true efficiency, especially due to the impact of domestic market obligation (DMO) policies on revenue, which can distort performance interpretation. However, productivity indicators are still considered critical and must be closely monitored, as they offer measurable short-term results that are immediately visible to management.

Given this situation, it is essential to determine the most suitable strategy to enhance the effectiveness of each KPI. The results of this alternative evaluation are presented in the table below.

Table 15. Alternative Improvement Strategies for Learning and Growth Perspective

KPI	Modify Component	Adjusting Weight	Refine Target	Top Alternative
Optimization of Talent Management	32%	15%	53%	Refine target
All Productivity Metrics Better Than Previous Year	40.2%	13.5%	46.3%	Refine target

Despite the misalignment in weight, the AHP alternative analysis showed that refining the target was the preferred solution for both KPIs. This means stakeholders feel that the KPIs are still relevant but require a better definition of measurement standards and more realistic target setting. To enhance

the result of this analysis, the performance also measured using Traffic Light System (TLS) which is presented in the table below.

Table 16. Traffic Light System for Learning and Growth Perspective

KPI	Red		Yellow		Green		Realization
Optimization of Talent Management	13%	75%	76%	89%	90%	100%	100%
All Productivity Metrics Better Than Previous Year	14%	75%	76%	90%	91%	100%	75.81%

The result of the performance evaluation shows that talent management at PTBA has already been implemented effectively, as reflected by its 100% achievement rate. However, the KPI "All Productivity Metrics Better Than Previous Year" demonstrated weaker performance and falls within the yellow zone. These findings suggest a mismatch between the set target and what is realistically achievable, which is also supported by the AHP alternative result.

Business Solution

Based on the AHP analysis and the Traffic Light System (TLS) assessment, several solutions are proposed to bridge the misalignment between PTBA's internal priorities and the Balanced Scorecard (BSC) structure mandated by MIND ID, in order to better align with market conditions, the company's operational capacity, and infrastructure limitations.

There is a difference in priorities, reflected in the differences between the weights assigned by MIND ID in the BSC and the internal priorities identified through AHP analysis. For example, KPIs such as "Reduction of Coal Cash Cost," "Re-estimation of Resources & Reserves in IUP," and "Implementation of Innovation Results" received higher weights in the AHP than what was originally assigned in the BSC. Conversely, KPIs such as "Absorption of Non-Routine Investment" and "Completion of the 2024 Procurement Work Program" were given higher weights in the BSC than suggested by internal stakeholder assessments.

In addition, interview findings revealed that certain KPIs were perceived as irrelevant or redundant and should be eliminated, particularly within the financial & market and internal business process perspectives. This highlights the need for PTBA to conduct a formal evaluation of its KPI structure, the results of which should be submitted and discussed with MIND ID as the holding company, which plays a key role in finalizing the company's Balanced Scorecard.

The most frequently selected alternative in the second layer of AHP analysis was "Refining the Target," which indicates that the KPI components in the Balanced Scorecard are generally aligned with PTBA's long-term objectives. However, several KPIs were considered to have unclear targets or measurement methods. This is further supported by the TLS analysis, which showed that underperformance in some KPIs was not due to structural irrelevance, but rather due to overly ambitious or poorly contextualized targets.

To address this, PTBA should establish a standardized target-setting protocol that takes into account historical trends, external limitations (such as the

DMO policy), operational capacity, and internal stakeholder expectations. This process should be complemented by annual validation using TLS thresholds (Red, Yellow, Green), enabling clearer performance benchmarking and more feasible KPI evaluation. As with the other recommendations, this process should be discussed and aligned with MIND ID to ensure shared understanding and strategic consistency.

CONCLUSION
Conclusion

This research was conducted to evaluate and optimize the alignment between PTBA's internal strategic priorities, and the Balanced Scorecard (BSC) structure mandated by MIND ID. By using the Analytic Hierarchy Process (AHP) method and the Traffic Light System (TLS) method to support the findings, this research aimed to answer the key question: how can PTBA improve the relevance, prioritization, and performance measurability of its Key Performance Indicators (KPIs) within the BSC framework.

The results showed that there are notable gaps between internal perceptions and the formal BSC structure. Several KPIs such as "Reduction of Coal Cash Cost," "Re-estimation of Resources & Reserves in IUP," and "Implementation of Innovation Results" received significantly higher weights from stakeholders through AHP analysis than the weights assigned in the official BSC. In addition, PTBA internal perceived indicators such as "Absorption of Non-Routine Investment" and "Completion of the 2024 Procurement Work Program" have lower strategic importance compared to the weight assigned in the BSC. These findings helped to bridge the need for KPI weigth and components

realignment based on internal expertise and evolving business priorities.

Moreover, the TLS analysis demonstrated that several KPIs underperformed not due to strategic irrelevance but due to unrealistic targets or unclear measurement criteria. The most frequently selected improvement alternative across all perspectives was "Refining the Target," which indicates the need for PTBA to develop more grounded and achievable targets. The research also identified several KPIs that stakeholders felt were redundant, too operational, or fragmented, especially within the Internal Business Process perspective, which suggest the need for simplifications.

Recommendation

Based on the results of this research, several implementation proposals are addressed to PTBA and other stakeholders involved in the BSC framework, such as MIND ID. First, it is recommended that PTBA initiate a formal discussion to review the structure of the BSC which cover the KPI weights, targets, measurement methods, and indicator definitions with all relevant internal stakeholders. This review should be based on the AHP analysis and interview findings, and which afterward is submitted to MIND ID for approval and harmonization at the holding company level.

Second, the company could adopt the Traffic Light System (TLS) as a tool for both KPI performance evaluation and target setting. The thresholds used in TLS can be derived from historical data, operational capacity, and external market conditions, such as the impact of the Domestic Market Obligation (DMO) policy, which directly affects corporate decision-making in operational execution.

Third, several KPIs, especially in the Internal Business Process perspective, should be revised, consolidated, or eliminated to reduce administrative redundancy and focus attention on what truly drives value. This includes KPIs that are considered duplicative, such as overlapping innovation projects or governance indicators that lack strategic impact.

Lastly, future research may explore broader implementation of AHP-TLS methods across other subsidiaries under MIND ID. This will enable a comparative analysis of KPI optimization practices in different operational contexts.

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