

Strategic Roadmap for Biodiesel Market Leadership Using Analyze-Formulate-Implement Framework and Analytical Hierarchy Process in Indonesia

AFI Framework and
AHP Approach

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ABSTRACT

Indonesia's biodiesel industry, driven by government mandates like the 2025 biodiesel blending policy, relies heavily on imported sodium methylate oxide, exposing it to supply chain risks and cost fluctuations. This study aims to develop a strategic roadmap for Company to enhance its market position in the sodium methylate oxide market and achieve a 50% market share by 2029. Employing the Analysis-Formulation-Implementation Framework, the research integrates qualitative interviews with stakeholders and quantitative analysis using the Analytic Hierarchy Process. Findings reveal that price, supply reliability, and product quality are critical factors influencing biodiesel producers' purchasing decisions. The Analytic Hierarchy Process prioritizes financial (29.9%), operational (27.9%), strategic (24.7%), and risk (17.5%) criteria, with the Borrow strategy forming partnerships with existing producers identified as the most effective approach (39.1%). The implementation plan focuses on strategic partnerships in key regions, starting with partner selection in 2025 and commercialization by 2028. This strategy leverages Company's strengths to reduce import dependency and enhance competitiveness. The study concludes that this approach positions Company as a market leader, supporting Indonesia's renewable energy goals while offering a replicable framework for strategic decision-making in the petrochemical sector.

Keywords: Biodiesel Industry, Borrow Strategy, Build-Borrow-Buy, Market Leader, Strategic Roadmap

ABSTRACT

Industri biodiesel Indonesia, yang didorong oleh mandat pemerintah seperti kebijakan pencampuran biodiesel 2025, sangat bergantung pada natrium metilat oksida impor, yang membuatnya terpapar pada risiko rantai pasokan dan fluktuasi biaya. Studi ini bertujuan untuk mengembangkan peta jalan strategis bagi Perusahaan untuk meningkatkan posisi pasarnya di pasar natrium metilat oksida dan mencapai pangsa pasar 50% pada tahun 2029. Dengan menggunakan Kerangka Analisis-Formulasi-Implementasi, penelitian ini mengintegrasikan wawancara kualitatif dengan para pemangku kepentingan dan analisis kuantitatif menggunakan Proses Hirarki Analitik. Temuan mengungkapkan bahwa harga, keandalan pasokan, dan kualitas produk merupakan faktor penting yang memengaruhi keputusan pembelian produsen biodiesel. Proses Hirarki Analitik memprioritaskan kriteria keuangan (29,9%), operasional (27,9%), strategis (24,7%), dan risiko (17,5%), dengan strategi Pinjam yang membentuk kemitraan dengan produsen yang ada yang diidentifikasi sebagai pendekatan yang paling efektif (39,1%). Rencana implementasi difokuskan pada kemitraan strategis di wilayah-wilayah utama, dimulai dengan pemilihan mitra pada tahun 2025 dan komersialisasi pada tahun 2028. Strategi ini memanfaatkan kekuatan Perusahaan untuk

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mengurangi ketergantungan impor dan meningkatkan daya saing. Studi ini menyimpulkan bahwa pendekatan ini memposisikan Perusahaan sebagai pemimpin pasar, mendukung tujuan energi terbarukan Indonesia sekaligus menawarkan kerangka kerja yang dapat direplikasi untuk pengambilan keputusan strategis di sektor petrokimia.

Keywords: *Industri Biodiesel, Strategi Pinjaman, Bangun-Pinjam-Beli, Pemimpin Pasar, Peta Jalan Strategis*

INTRODUCTION

The oil and gas sector has long been a cornerstone of Indonesia's economy, significantly contributing to the national Gross Domestic Product (GDP) while playing a vital role in energy security and industrial growth. However, data from PwC Indonesia highlights a steady decline in the sectors GDP contribution, dropping from 5.45% in 2013 to 2.49% in 2023, reflecting a broader shift toward economic diversification. This transformation aligns with global energy trends, market volatility, and post-pandemic recovery, driving increased investments in renewable energy. The palm oil and biodiesel industries have emerged as key priorities, with Indonesia leading as the world's top palm oil producer, generating over 30 million tons annually, contributing 4.5% to GDP, and employing more than three million people, according to Gürel and Tat (2017). Biodiesel has gained momentum, fueled by government mandates like the B35 policy in 2023 and the upcoming B40 policy in 2025, as outlined by Kementerian ESDM in 2025. These initiatives aim to reduce dependence on imported fossil fuels and cut greenhouse gas emissions, positioning Indonesia as a leader in the Asia-Pacific biodiesel market with a 23% global share, per Ipsos (2024).

Central to biodiesel production is the transesterification process, where Fatty Acid Methyl Ester (FAME) relies on Sodium Methylate Oxide (SMO) as a catalyst. Despite its critical role, Indonesia imported nearly all of its 140,559 tons of SMO in 2023, primarily from Germany, China, and the Middle East, exposing the sector to supply chain risks, currency fluctuations, and cost competitiveness issues, as noted by the International Trade Centre (n.d.). Company, the Commercial and Trading Subholding of PT Energy (Persero), a state-owned enterprise, is strategically positioned to address this dependency and bolster the chemical supply chain. Tasked with managing downstream fuel products, Liquefied Petroleum Gas (LPG), lubricants, and petrochemicals, the company aims to become a world-class energy provider by integrating Environmental, Social, and Governance (ESG) principles and aligning with the United Nations Sustainable Development Goals (SDGs).

The Ministry of State-Owned Enterprises has endorsed Company's House of Strategy, emphasizing expansion in the petrochemical sector, particularly in marketing and distributing value-added products like SMO, as highlighted by Rothaermel (2021). Over the past five years, the company has made strides in the SMO market, achieving a 9.7% market share, yet this falls well short of its ambitious goal of 50% within the next five years. Internal data from Company reveals steady growth in biodiesel adoption, supported by rising production volumes and policy-driven demand, while sales data underscores the gap between current SMO market performance and the company's long-term target. This discrepancy signals substantial growth potential but also underscores the need for a robust strategy to navigate complex stakeholder dynamics across the SMO value chain, including raw material suppliers, FAME producers, logistics providers, and regulators. Research on Indonesia biodiesel and SMO markets remains limited, particularly in addressing strategic approaches to reduce import reliance and enhance domestic market share.

According to Khan and Ali (2020), prior studies often focus on technical aspects of biodiesel production, such as catalyst efficiency, but rarely explore strategic frameworks for market expansion in the SMO sector. Similarly, Hill et al. (2015) emphasize competition in the biodiesel industry yet overlook actionable strategies for state-owned

enterprises to lead in catalyst supply chains. This research gap highlights the need for a comprehensive, multi-disciplinary approach combining energy policy, supply chain management, and industrial strategy to guide Company. Thus, the primary objective of this study is to formulate a strategic roadmap for Company to strengthen its position as a leading domestic SMO supplier within five years. Specifically, the research aims to identify key factors influencing FAME producers purchasing decisions, evaluate strategic options to enhance market share, and develop a detailed implementation plan. The scope focuses on Indonesia's SMO market, with an emphasis on its role in the biodiesel industry and key stakeholders directly impacting company operations.

LITERATURE REVIEW

Theoretical Foundations

Strategic management theory, as articulated by Porter (1985), emphasizes achieving competitive advantage by aligning internal resources with external market opportunities, critical for Company's ambition to dominate The Sodium Methylate Oxide (SMO) market. This theory underscores leveraging the company's methanol trading expertise to address import dependency, a key barrier to market leadership in Indonesia's biodiesel industry. Supply chain resilience, defined by Christopher and Peck (2004), focuses on mitigating disruptions, such as those caused by reliance on imported SMO, through strategies like localized sourcing or partnerships. These theories anchor the Analyze Formulate Implement (AFI) Framework, which structures analysis, formulation, and implementation to navigate complex market dynamics, ensuring Company's strategic roadmap aligns with renewable energy goals (Rothaermel, 2021).

The integration of strategic management and supply chain resilience enhances the applicability of Analytical Hierarchy Process (AHP) in prioritizing strategic options under uncertainty, such as volatile raw material costs (Saaty & Vargas, 2006). AHP's structured decision-making complements AFI by evaluating criteria like financial viability and supply security, critical for addressing FAME producers' demands. This theoretical synergy supports Company's goal of reducing import risks while capitalizing on policy-driven SMO demand, such as the B40 mandate, positioning the company for market leadership (Hillman et al., 2009). By grounding the study in these theories, the research ensures a robust foundation for strategic decision-making.

Key Constructs

Competitive advantage, defined by Porter (1985) as delivering superior value through cost leadership or differentiation, is central to Company's strategy to offer reliable SMO supply at competitive prices, distinguishing it from global competitors like Evonik and Badische Anilin- und Soda-Fabrik (BASF). Supply chain resilience, per Sheffi and Rice (2005), refers to the ability to anticipate and recover from disruptions, crucial for mitigating risks from SMO import dependency in a volatile global market. B2B purchase behavior, as outlined by Armstrong et al. (2018), encompasses rational factors like price and quality, and emotional factors like trust, shaping Fatty Acid Methyl Ester (FAME) producers' preferences for reliable local suppliers. Market leadership, defined by Hill et al. (2015) as dominant market share and industry influence, is Company's ultimate goal, achievable through strategic partnerships.

These constructs directly inform the AFI Framework's stages, guiding analysis of market dynamics, formulation of strategies, and implementation of actionable plans (Rothaermel, 2021). For instance, competitive advantage drives the selection of the Borrow strategy in AHP, addressing B2B preferences for supply reliability (Saaty & Vargas, 2006). Supply chain resilience ensures strategies mitigate import risks, while market leadership aligns with Indonesia's renewable energy objectives. By defining these constructs, the study bridges theoretical insights with practical applications, ensuring Company's roadmap is both robust and contextually relevant (Barney, 2001).

Analysis Stage Frameworks

Value Chain Analysis supports strategic management theory by identifying Company's internal strengths, such as robust customer service, and weaknesses, like import dependency, which undermine supply chain resilience (Porter, 1985; Christopher & Peck, 2004). This framework highlights the need for localized SMO production to enhance competitive advantage through reliable supply, addressing FAME producers' priorities. The Politics, Economics, Social, Technology, Environment, and Law (PESTEL) framework (Porter, 2008) complements this by analyzing external factors, such as Indonesia's B40 policy driving SMO demand and raw material price volatility impacting B2B purchase behavior (Armstrong et al., 2018). Porter (1985) and Hillman's et al. (2009) five forces reveal high supplier power due to import reliance, emphasizing strategic interventions to reduce dependency.

These frameworks form the analysis stage of AFI, providing a comprehensive understanding of internal capabilities and external dynamics to inform strategy formulation (Rothaermel, 2021). For example, PESTEL identifies opportunities from government incentives, while Five Forces underscores the need to counter supplier power through local partnerships. By integrating these analyses, Company can address supply chain vulnerabilities and capitalize on policy-driven opportunities, aligning with B2B purchase behavior demands for cost and reliability (Sheffi & Rice, 2005). This stage ensures the strategic roadmap is grounded in a thorough assessment of market and operational realities.

Formulation Stage Frameworks

The Build-Borrow-Buy framework and strategic management theory offer pathways—building production, borrowing through partnerships, or purchasing facilities—to achieve competitive advantage in SMO markets (Porter, 1985; Rothaermel, 2021). The Borrow strategy, involving partnerships with existing producers, supports supply chain resilience by reducing import risks without high capital costs, addressing FAME producers' needs (Sheffi & Rice, 2005). AHP, as described by Saaty and Vargas (2006), structures decision-making by prioritizing criteria like financial viability and supply security, aligning with B2B purchase behavior demands for price and reliability (Armstrong et al., 2018). AHP's pairwise comparisons ensure robust evaluation, ideal for volatile markets like SMO (Khan & Ali, 2020).

AHP's application in the formulation stage of AFI enables Company to systematically evaluate strategic options, leveraging its methanol trading expertise to enhance market leadership (Barney, 2001). By prioritizing the Borrow strategy, AHP addresses supply chain resilience by mitigating import dependency, a key risk in Indonesia's biodiesel industry. This framework's ability to incorporate stakeholder inputs ensures alignment with market dynamics, offering a cost-effective path to competitive advantage (Gulati, 1998). These frameworks collectively translate analytical insights into actionable strategies, positioning Company for sustained growth.

Implementation Stage Frameworks

The Five Elements of Strategy operationalize strategic management theory by defining the arena, vehicle, differentiator, staging, and economic logic for achieving market leadership (Porter, 1985; Hambrick & Fredrickson, 2005). Figure 1, Conceptual Framework, illustrates how these elements integrate with AFI to link analysis, formulation, and implementation, ensuring a cohesive strategy for Company (Rothaermel, 2021). The framework addresses supply chain resilience by establishing local partnerships to mitigate import risks, aligning with FAME producers' B2B purchase priorities for reliability and cost (Armstrong et al., 2018). Strategic alliances enhance competitive advantage, though risks like partnership negotiations require careful management (Sheffi & Rice, 2005).

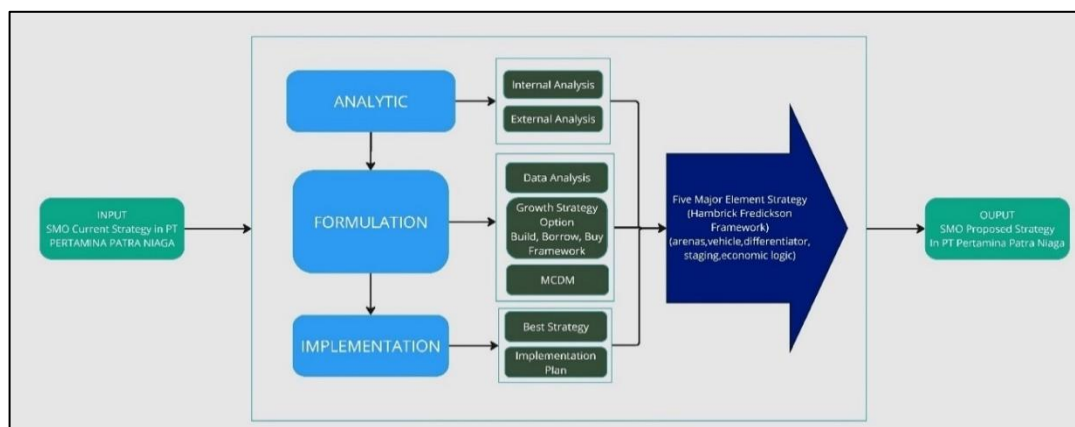


Figure 1. Conceptual Framework

The implementation stage of AFI translates the Borrow strategy into actionable steps, ensuring Company achieves a 50% market share by 2029 (Hambrick & Fredrickson, 2005). By focusing on local supply through joint ventures, the strategy addresses supply chain vulnerabilities, supporting Indonesia's renewable energy goals. This stage emphasizes phased execution, with partner selection in 2025 and commercialization by 2028, balancing cost efficiency with market control (Gulati, 1998). The framework's structured approach ensures alignment with stakeholder expectations and market dynamics, fostering sustainable growth.

RESEARCH METHOD

This study uses a structured methodology design to formulate a strategic roadmap for companies to strengthen their position in the sodium methylate oxide (SMO) market in the Indonesian biodiesel industry. The approach used integrates the Analyze, Formulate, and Implement (AFI) framework with qualitative and quantitative methods to produce a comprehensive analysis and applicable strategic recommendations. The initial stage begins with a business situation analysis, which includes two main approaches: internal and external analysis. Internal analysis is carried out through value chain analysis and qualitative interviews with internal stakeholders of the company to explore strengths, weaknesses, and operational capabilities. Meanwhile, external analysis includes PESTEL analysis, Porter's Five Forces, and a study of B2B purchasing behavior by FAME (Fatty Acid Methyl Ester) producers. This process aims to understand market dynamics, competitive pressures, and policy trends that affect demand for SMO. Data collection is carried out primarily and secondary to create a comprehensive understanding of the SMO value chain. Primary data were collected through semi-structured interviews with three internal and external parties for value chain analysis, three respondents for PESTEL, four for Porter's Five Forces, and three external SMO buyers for B2B buying behavior. In addition, Focus Group Discussions (FGDs) were conducted with three internal decision makers and related field experts to validate the results and develop an implementation plan based on the Five Elements of Strategy.

Secondary data were obtained from internal company reports, industry analysis from ICIS and IHS Markit, and official data from the Central Statistics Agency (BPS) and the Ministry of Energy and Mineral Resources. At the strategy formulation stage, eight internal experts were involved through interviews and document studies to apply the Build-Borrow-Buy framework and the Analytic Hierarchy Process (AHP) to develop a strategy that is data-driven and in line with the market context. The data analysis process consisted of qualitative and quantitative synthesis. Interviews and FGDs were analyzed using content analysis techniques to identify key themes, challenges, and opportunities, including critical issues such as supply availability and price pressures. Quantitatively, the AHP method is used to create a hierarchy of objectives, criteria (financial, operational, strategy, risk), and strategic alternatives (build, borrow, buy). Eight internal departments

provide weighting through AHP supervision to ensure that strategy selection is aligned with company priorities and market conditions. This integration of qualitative and quantitative approaches creates a strong common thread from the analysis stage to research and implementation. By using the AFI framework as the main guide, this method ensures that the research process runs logistically and systematically, resulting in strategies that can increase the company's competitiveness amidst the challenges of the national biodiesel industry.

RESULTS

The results of this study provide a comprehensive analysis of Company's current position in the SMO market and outline a strategic pathway to achieve market leadership in Indonesia's biodiesel industry. The findings stem from a systematic application of the AFI Framework, combining internal and external analyses, strategy formulation via the Analytic Hierarchy Process (AHP), and a detailed implementation plan. Internal analysis, guided by Porter's Value Chain framework (Porter, 1985), reveals critical insights into Company's operations. The company currently operates solely as an SMO trader, lacking domestic production capacity and relying entirely on imports from countries like China, Germany, and Saudi Arabia. This dependency exposes the firm to supply chain risks, including price volatility and delivery delays, which undermine its competitiveness. Primary activities, such as inbound and outbound logistics, emerge as key weaknesses due to the absence of domestic storage facilities and local production infrastructure, hindering responsiveness to customer demand from biodiesel producers (FAME producers) who prioritize consistency and reliability. Despite these challenges, Company demonstrates strong customer service performance, as acknowledged by FAME clients, indicating a foundation for growth. To enhance market position, the analysis underscores the need for domestic integration through upstream investment or strategic partnerships to strengthen supply reliability and price control, aligning with the company's goal of achieving a 50% market share by 2029.



Figure 2. Indonesia's SMO Market Share

External analysis provides a broader perspective on the SMO market dynamics, highlighting both opportunities and competitive pressures. The microenvironment analysis, as depicted in Figure 2, Indonesia's SMO Market Share (Ipsos, 2024), shows intense competition, with major players like Evonik, BASF, and Gesico dominating the market, while Company holds a modest 7.4% share in 2023. Chinese suppliers lead with over 37% of the market, underscoring the challenge of import dependency. Key customers, primarily biodiesel producers, prioritize supply continuity, price, and service responsiveness in their purchasing decisions. The PESTEL framework reveals critical macro-environmental influences. Politically, government mandates like the B40 blending policy in 2025, supported by fiscal incentives, drive SMO demand, as noted by

Kementerian ESDM (2025). Economically, volatility in raw material costs, such as methanol and caustic soda, alongside exchange rate fluctuations, impacts SMO pricing and profitability. Socially and environmentally, biodiesel adoption supports Indonesia’s 2060 net-zero emission targets, though palm oil sustainability concerns could shape market perceptions, as highlighted by Gürel and Tat (2017). Technologically, SMO remains the most effective catalyst for biodiesel production, with alternatives like enzymes or potassium-based catalysts less viable at scale. Porter (1985) identified a high Five Forces Analysis of suppliers due to import dependence and a moderate threat from new entrants due to technical and regulatory barriers. Buyer power is significant, as FAME producers are highly price- and reliability-sensitive, emphasizing the need for company to address these factors to gain a competitive edge.

The B2B purchase behavior analysis, informed by Armstrong et al. (2018), clarifies SMO buyer priorities in Indonesia. Environmental factors, including price volatility and global methanol market fluctuations, drive a preference for local suppliers offering reliable delivery. Organizationally, buyers seek stable production, competitive pricing, and quality consistency, while interpersonally, procurement managers value technical support and responsive service to maintain trust. Individually, buyers prioritize cost efficiency, supply security, and low production risks, favoring suppliers with consistent quality and flexible terms (Hill et al., 2015). These insights highlight that company, as a trader, faces significant challenges competing with producer-competitors like Evonik and BASF. Strategic shifts toward local supply capabilities are critical to meet buyer demands and achieve market leadership within five years, reducing reliance on imports and enhancing service reliability.

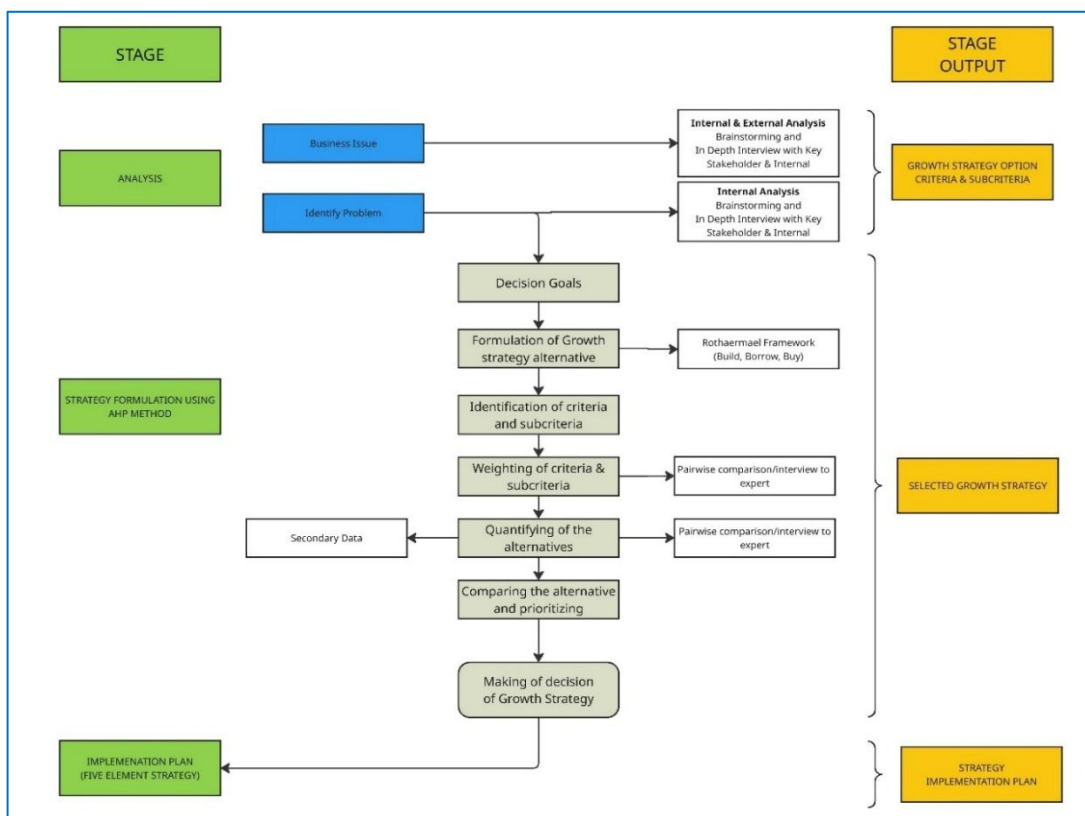


Figure 3. Step by Step AHP Processes

Strategy formulation uses the Build-Borrow-Buy Framework Rothaermel (2021) to evaluate three options: building an SMO plant for supply control, requiring high capital; borrowing through partnerships with existing producers for faster, cost-effective implementation; or buying a producer for immediate capacity, despite integration challenges. The AHP, per Saaty and Vargas (2006), structures this decision, with criteria

and sub-criteria defined in Table 1, Criteria and Subcriteria for AHP Analysis (AHP Interviews to SMEs, 2025), based on interviews with three SMEs from VP to CEO level. The criteria include Financial, Strategic, Operational, and Risk, with sub-criteria like Profit, Business Sustainability, and Security of Supply guiding the evaluation process. This structured approach ensures a systematic comparison of alternatives, aligning with Company’s strategic priorities and market demands.

Table 1. Decision Hierarchy of Criteria and Subcriteria for AHP Analysis

Level 0	Level 1	Level 2
Build Borrow Buy	Financial	Revenue
		Profit
		Investment Requirement
	Strategic	Market Control
		Business Sustainability
		Time for Execution
	Operational	Alignment with Pertamina core business
		Security of Supply
	Risk	Legal Risk
		Financial Risk

Table 2. Decision Hierarchy of Weight Percentage Summary

Level 0	Level 1	Level 2	Glb Prio.	
Build Borrow Buy	Financial	Revenue	0.260	7.8%
		Profit	0.547	16.4%
		Investment Requirement	0.193	5.8%
	Strategic	Market Control	0.413	10.2%
		Business Sustainability	0.587	14.5%
		Time for Execution	0.285	7.9%
	Operational	Alignment with Pertamina core business	0.153	4.3%
		Security of Supply	0.563	15.7%
	Risk	Legal Risk	0.402	7.1%
		Financial Risk	0.598	10.5%

AHP results, derived from surveys with eight internal SMEs, prioritize the strategic alternatives. Table 2, Weight Percentage Summary (AHP Interviews to SMEs, 2025), shows financial criteria weighted highest at 0.299, with Profit (16.4%) as the top sub-criterion, followed by Operational (0.279) with Security of Supply (15.7%), Strategic (0.247) with Business Sustainability (14.5%), and Risk (0.175) with Financial Risk (10.5%). Table 5, Best Alternative Strategy Decision Making Using AHP (AHP Analysis, 2025), indicates the Borrow option scoring highest at 39.1 percent, followed by Build (37.5%) and Buy (23.4%). The Borrow strategy, involving partnerships with existing SMO producers, aligns with key sub-criteria, enabling reduced import reliance and supply risk mitigation while leveraging joint ventures for local production, as supported by Khan and Ali (2020).

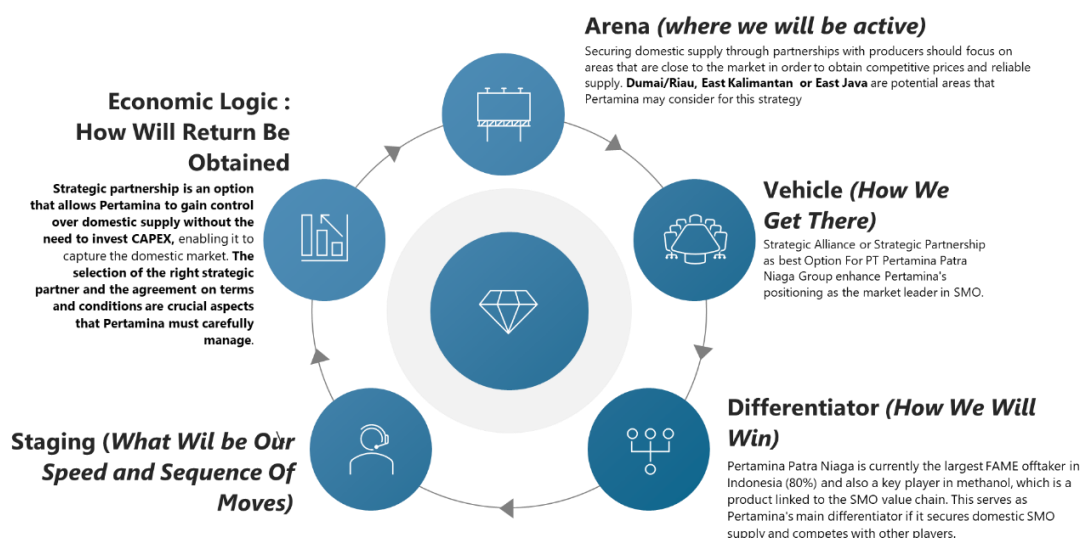


Figure 4. Hambrick & Fredrickson's Framework – Strategy Implementation Plan Summary

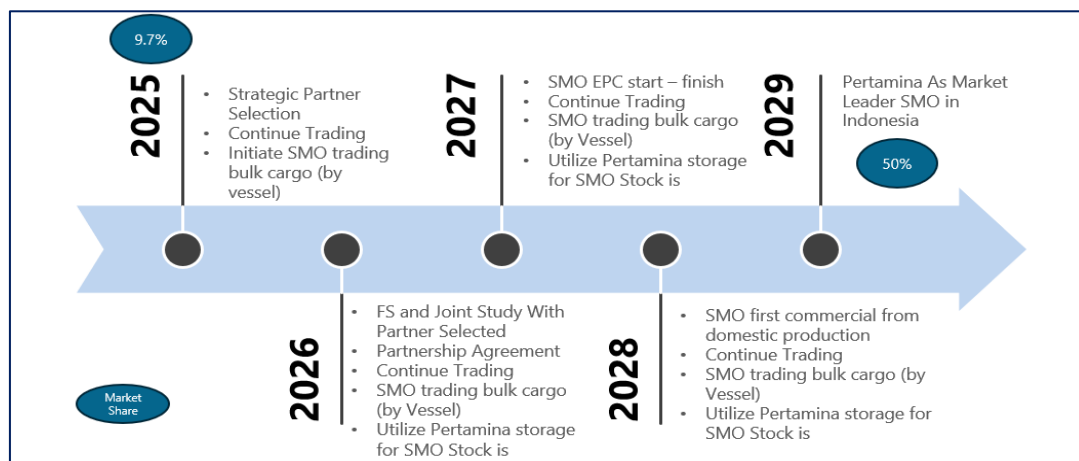


Figure 5. SMO Staging Timeline Strategy Implementation Plan

The implementation plan operationalizes the Borrow strategy using Hambrick and Fredrickson's Five Elements of Strategy (Hambrick & Fredrickson, 2005). Figure 4, Hambrick and Fredrickson's Framework – Strategy Implementation Plan Summary (FGD with Company Decision Makers, 2025), outlines the approach: arenas target the domestic SMO market, focusing on FAME producers in regions like Dumai/Riau, East Kalimantan, and East Java; vehicles include joint ventures and offtake agreements; differentiators emphasize local supply reliability, competitive pricing, and responsive service; staging involves partner selection in 2025, feasibility studies in 2026, EPC activities in 2027, and commercialization in 2028; and economic logic focuses on profitability through import substitution. Figure 5, SMO Staging Timeline Strategy Implementation Plan (FGD with Company Decision Makers, 2025), details the phased timeline, informed by focus group discussions, positioning company to achieve a 50% market share by 2029 and establish market leadership.

DISCUSSION

This study's findings illuminate a strategic pathway for the company to secure a 50% market share in Indonesia's SMO market by 2029, addressing a critical research gap in catalyst supply chain strategies for the biodiesel industry (Hill et al., 2015). AHP prioritization of the Borrow strategy (39.1%) over Build (37.5%) and Buy (23.4%) aligns with Porter's Value Chain Analysis (1985), which revealed import dependency as a primary operational weakness undermining supply chain resilience (Christopher & Peck,

2004). By advocating partnerships with existing SMO producers, the Borrow strategy practically enables Company to mitigate supply disruptions and meet FAME producers' demands for reliability and competitive pricing, as emphasized by B2B purchase behavior models (Armstrong et al., 2018). Theoretically, this approach extends the Build-Borrow-Buy Framework as described by Rothaermel (2021) by demonstrating its application to state-owned firms navigating resource-constrained and policy-driven markets such as the Indonesian biodiesel sector. The integration of AHP further enriches strategic management theory by offering a structured method to balance financial (29.9%), operational (27.9%), and strategic (24.7%) criteria, addressing the complexities of volatile raw material costs and regulatory dynamics (Saaty & Vargas, 2006).

The Borrow strategy's alignment with Indonesia's B40 policy, as highlighted by PESTEL analysis (Porter, 2008), underscores its practical significance in supporting national energy resilience goals (Kementerian ESDM, 2025). By leveraging Company's methanol trading expertise, the strategy reduces reliance on imports from China and Germany, practically lowering costs and risks associated with currency fluctuations (Ponomarov & Holcomb, 2009). Theoretically, it contributes to the supply chain resilience literature by illustrating how strategic alliances can overcome high supplier power, a dynamic identified through the Five Forces (Porter, 1985). Unlike simpler decision-making tools, AHP's pairwise comparisons ensure robust prioritization, making it particularly effective in the SMO market's competitive landscape (Khan & Ali, 2020). This dual impact, practical cost efficiency and theoretical advancement positions the study as a bridge between industry needs and academic discourse, offering a replicable model for state-owned enterprises in renewable energy sectors.

The broader implications of this research extend beyond Company, offering practical guidance for other firms facing similar supply chain vulnerabilities in petrochemical or biodiesel industries. By establishing local partnerships, the strategy enhances energy security, a pressing concern for developing economies reliant on imported inputs (Hillman et al., 2009). Theoretically, the integration of AFI and AHP frameworks advances strategic management by providing a multidisciplinary approach to decision-making in complex markets, aligning with dynamic capability perspectives (Tece, 2010). This framework's adaptability suggests its potential application in other policy-driven industries, such as solar or wind energy, where supply chain resilience is critical. However, the study's focus on short- to medium-term strategies limits its exploration of long-term policy shifts, such as potential changes in biodiesel mandates. Practically, this may constrain scalability, while theoretically, it restricts insights into evolving resource-based views (Barney, 2001). Despite these limitations, the Borrow strategy's phased implementation, from partner selection in 2025 to commercialization by 2028, ensures alignment with Indonesia's sustainability agenda, reinforcing Company's role as a market leader and contributing to global renewable energy discourse.

CONCLUSION

This study delivers a strategic roadmap for the company to achieve a 50% SMO market share by 2029, leveraging the Borrow strategy (39.1 percent, AHP) to address FAME producers' priorities of price, reliability, and quality. Practically, partnerships with existing producers reduce import dependency, enhancing supply chain resilience and aligning with Indonesia's B40 policy, thereby supporting national energy security. Theoretically, integrating AFI and AHP enriches strategic management literature by offering a structured approach to decision-making in complex, policy-driven markets, addressing the gap in catalyst supply chain strategies. However, limitations, such as restricted access to proprietary competitor data and a short- to medium-term focus, may limit competitive analysis and overlook long-term policy shifts. Future research could explore the long-term impacts of domestic SMO production on energy resilience or investigate alternative catalysts using AHP, broadening theoretical insights into sustainable supply chains. Managerially, the roadmap equips Company's leadership with

a clear implementation plan, from 2025 partner selection to 2028 commercialization, fostering strategic agility in a competitive market.

The findings' relevance extends to policymakers and global biodiesel industries, offering a replicable model for localized supply chains that enhance energy security and sustainability. Managerially, the strategy empowers decision-makers to prioritize partnerships that balance cost efficiency with supply reliability, ensuring alignment with stakeholder expectations. Theoretically, the study extends the Build-Borrow-Buy Framework by applying it to renewable energy contexts, paving the way for research into dynamic capabilities in state-owned enterprises. As Indonesia advances its renewable energy agenda, this roadmap positions company as a catalyst for sustainable growth, contributing to the nation's 2060 net-zero emissions target and reinforcing its leadership in the global transition to a greener future.

REFERENCES

- [1] Armstrong, G. M., Adam, S., Denize, S. M., Volkov, M., & Kotler, P. (2018). *Principles of marketing* (7th ed.). London: Pearson Education.
- [2] Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4), 717–736.
- [3] Barney, J. B. (2001). *Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view*. Upper Saddle River: Pearson Education.
- [4] Barney, J. B. (2011). *Gaining and sustaining competitive advantage* (4th ed.). Upper Saddle River: Pearson Education.
- [5] Bhattacharya, A. K., & Wheatley, K. K. (2006). Decision making in a complex environment: Application of the analytic hierarchy process. *International Journal of Management and Decision Making*, 7(2), 231–246.
- [6] Capron, L., & Mitchell, W. (2012). *Build, borrow, or buy: Solving the growth dilemma*. Boston: Harvard Business Review Press.
- [7] Chopra, S., & Meindl, P. (2016). *Supply chain management: Strategy, planning, and operation* (6th ed.). Boston: Pearson Education.
- [8] Chopra, S., & Sodhi, M. S. (2004). Managing risk to avoid supply-chain breakdown. *MIT Sloan Management Review*, 46(1), 53–61.
- [9] Christopher, M. (2016). *Logistics and supply chain management* (5th ed.). London: Pearson Education.
- [10] Christopher, M., & Peck, H. (2004). Building the resilient supply chain. *The International Journal of Logistics Management*, 15(2), 1–14.
- [11] Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review*, 23(4), 660–679.
- [12] Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st century business*. Oxford: Capstone Publishing.
- [13] Ellram, L. M., & Carr, A. (1994). Strategic purchasing: A history and review of the literature. *International Journal of Purchasing and Materials Management*, 30(2), 10–18.
- [14] Forman, E. H., & Gass, S. I. (2001). The analytic hierarchy process—An exposition. *Operations Research*, 49(4), 469–486.
- [15] Freeman, R. E. (2010). *Strategic management: A stakeholder approach*. Cambridge: Cambridge University Press.
- [16] Freeman, R. E., Harrison, J. S., & Wicks, A. C. (2007). *Managing for stakeholders: Survival, reputation, and success*. New Haven: Yale University Press.
- [17] Grant, R. M. (1998). *Contemporary strategy analysis* (3rd ed.). Oxford: Blackwell Publishers.
- [18] Gulati, R. (1998). Alliances and networks. *Strategic Management Journal*, 19(4), 293–317.
- [19] Gulati, R., & Kletter, D. (2005). Shrinking core, expanding periphery: The relational architecture of high-performing organizations. *California Management Review*, 47(3), 77–104.
- [20] Gürel, E., & Tat, M. (2017). SWOT analysis: A theoretical review. *The Journal of International Social Research*, 10(51), 994–1006.
- [21] Hambrick, D. C., & Fredrickson, J. W. (2005). Are you sure you have a strategy? *Academy of Management Perspectives*, 19(4), 51–62.
- [22] Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal*, 24(10), 997–1010.
- [23] Hill, C. W. L., Schilling, M. A., & Jones, G. R. (2015). *Strategic management: Theory* (10th ed.). Boston: Cengage Learning.
- [24] Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource dependence theory: A review. *Journal of management*, 35(6), 1404–1427.

- [25] Hitt, M. A., Ireland, R. D., & Hoskisson, R. E. (2017). *Strategic management: Concepts and cases: Competitiveness and globalization* (12th ed.). Boston: Cengage Learning.
- [26] International Trade Centre. (n.d.). *Trade Map: Trade statistics for international business development*. Retrieved on March 1, 2025 from <https://www.trademap.org/Index.aspx>
- [27] Ireland, R. D., Hitt, M. A., & Vaidyanath, D. (2002). Alliance management as a source of competitive advantage. *Journal of Management*, 28(3), 413–446.
- [28] Keeney, R. L., & Raiffa, H. (1993). *Decisions with multiple objectives: Preferences and value trade-offs*. Cambridge: Cambridge University Press.
- [29] Kementerian ESDM Republik Indonesia. (2025). *Wujudkan ketahanan energi dan kurangi impor, Menteri ESDM: Mandatori B40 berlaku 1 Januari 2025*. Retrieved on March 6, 2025 from <https://www.esdm.go.id/id/media-center/arsip-berita/wujudkan-ketahanan-energi-dan-kurangi-impor-menteri-esdm-mandatori-b40-berlaku-1-januari-2025>
- [30] Khan, A. U., & Ali, Y. (2020). Analytical hierarchy process (AHP) and analytic network process methods and their applications: A twenty-year review from 2000–2019. *International Journal of the Analytic Hierarchy Process*, 12(3), 369–459.
- [31] Kleindorfer, P. R., & Saad, G. H. (2005). Managing disruption risks in supply chains. *Production and Operations Management*, 14(1), 53–68.
- [32] Kotler, P., & Keller, K. L. (2017). *Marketing management* (15th ed.). London: Pearson Education.
- [33] Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining supply chain management. *Journal of Business Logistics*, 22(2), 1–25.
- [34] Mintzberg, H., Ahlstrand, B., & Lampel, J. (1998). *Strategy safari: A guided tour through the wilds of strategic management*. New York: Free Press.
- [35] Mubarok, A. M., Kirono, I., Sukaris, S., & Cahyadi, N. (2024). Analytical hierarchy process method as a solution to fiber optic cable supplier quality. *Jurnal Ilmiah Manajemen Kesatuan*, 12(6), 2149–2156.
- [36] Pettit, T. J., Fiksel, J., & Croxton, K. L. (2010). Ensuring supply chain resilience: Development of a conceptual framework. *Journal of Business Logistics*, 31(1), 1–21.
- [37] Ponomarov, S. Y., & Holcomb, M. C. (2009). Understanding the concept of supply chain resilience. *The International Journal of Logistics Management*, 20(1), 124–143.
- [38] Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York: Free Press.
- [39] Porter, M. E. (1998). *Competitive strategy: Techniques for analyzing industries and competitors: With a new introduction*. New York: Free Press.
- [40] Porter, M. E. (2008). *Competitive strategy: Techniques for analyzing industries and competitors*. New York: Simon and Schuster.
- [41] Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review*, 89(1), 62–77.
- [42] PwC Indonesia. (2024). *Oil and gas in Indonesia: Investment, taxation and regulatory guide 2024*. Available at: <https://www.pwc.com/id/en/pwc-publications/industries-publications/energy-utilities---mining-publications/oil-gas-guide-2024.html>
- [43] Rothaermel, F. T. (2021). *Strategic management* (5th ed.). New York: McGraw-Hill Education.
- [44] Saaty, T. L. (2008). *Decision making for leaders: The analytic hierarchy process for decisions in a complex world* (3rd ed.). Pittsburgh: RWS Publications.
- [45] Saaty, T. L., & Vargas, L. G. (2006). *Decision making with the analytic network process: Economic, political, social and technological applications with benefits, opportunities, costs and risks*. New York: Springer Science+Business Media.
- [46] Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 16(15), 1699–1710.
- [47] Sheffi, Y., & Rice Jr, J. B. (2005). A supply chain view of the resilient enterprise. *MIT Sloan management review*, 47(1), 41–48.
- [48] Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, 43(2), 172–194.
- [49] Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180.
- [50] Wheelen, T. L., & Hunger, J. D. (2011). *Strategic management and business policy: Toward global sustainability* (13th ed.). Upper Saddle River: Pearson Education.