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## **DEVELOPING BUSINESS STRATEGY TO ACHIEVE SUSTAINABLE GAS DELIVERABILITY BUSINESS FOR KANGEAN ENERGY INDONESIA Ltd. THROUGH SCENARIO PLANNING**

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### **Abstract**

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*Indonesia's rapid economic growth has increased energy demands, necessitating a robust energy security strategy. In this context, natural gas is crucial as a transitional energy source for achieving net-zero emissions. Despite the abundance of natural gas reserves in the country, the government foresees a potential imbalance between demand and supply, posing risks of disruptions in the energy sector. To address these challenges, this study focuses on formulating a business strategy for Kangean Energy Indonesia Ltd. (KEI) over the next five years, focusing on ensuring sustainable gas deliverability through applying qualitative scenario planning. Scenario planning is a valuable analytical tool to identify and address the uncertainties that may impact the Indonesian gas industry. This methodological approach builds a strong foundation for developing effective business strategies. The research draws upon both primary and secondary data sources. Based on a comprehensive stakeholder mapping, primary data is acquired through interviews with eight carefully selected stakeholders. Through these interviews, the study highlights two critical uncertainties that significantly influence the gas industry: supply and infrastructure. The study culminates in creating a comprehensive scenario framework complemented by detailed narratives exploring plausible future developments. Furthermore, the research delves into the implications and options for alternative strategies in light of these scenarios. Additionally, identifying early warning signals becomes instrumental in KEI's agile response to potential changes in the industry landscape. Through this approach, KEI can enhance its preparedness to address future challenges, ensuring sustained success in the dynamic and ever-evolving gas deliverability business. As Indonesia's energy landscape continues to evolve, KEI's commitment to scenario planning will be instrumental in securing the nation's stable and prosperous energy future.*

**Keywords:** *scenario planning, strategic decision making, natural gas, gas supply, infrastructure*

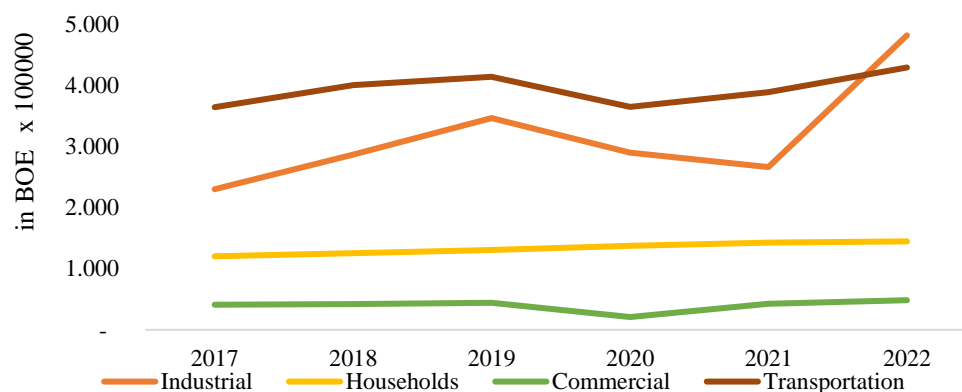
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### **INTRODUCTION**

The indisputable fact of human dependence on energy has divulged the prominence of finding a reliable and affordable energy source. Inevitably, a country's national welfare often being associated with the capability to meticulously manage its energy supply and security (Gasser, 2020). Failure to meet energy demand is often linked to low national productivity and poverty, which are critical elements in achieving sustainable development (Le & Nguyen, 2019). In addition, with increasing awareness of environmental responsibility, regarding the current climate situation, countries are forced to take immediate action to lower greenhouse gas (GHG) emissions by transitioning to greener energy, as promulgated in the 2015 Paris Agreement (Tolliver et al., 2019).

Indonesia faces a substantial challenge in assuring energy security due to its accelerated economic growth, resulting in a sudden increase in energy surpassing the available energy supplies (Cahyono et al., 2022). Historically, transportation has been the leading sector for national energy consumption. However, in 2022, the industrial sector surpassed transportation as the largest consumer, accounting for 481.2 million barrels of oil equivalent (MMBOE) or 44% of total consumption, exceeding the industrial sector's share of 39%, followed by households (13%), and commercial (4%) (MEMR, 2022). Consequently, fulfilling the energy demand of all sectors must have become critical to support the revitalization of the national economy. The enactment of energy security is currently being focused on four main aspects known as the Four As, as follows (APEREC, 2007):

1. Availability: ensuring an available and sufficient amount of energy supply.
2. Accessibility: establishing reliable infrastructure in supporting a robust supply chain of energy from upstream to downstream as a commitment to ensuring fair energy distribution across the country.
3. Acceptability: ensuring the negative impacts of energy utilization are suppressed and are at an acceptable level to the customer.
4. Affordability: corroborating sufficiently low energy resources.

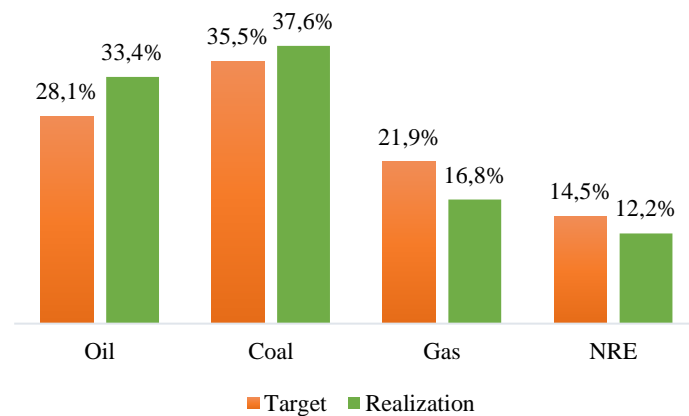


**Figure 1 Final Energy Consumption by Sector from 2017 to 2022**

**Source: (MEMR, 2022) (Processed)**

As a country with the most significant primary energy supply in ASEAN, accounting for 36%, Indonesia's contribution in reducing global emissions is momentous (Vidinopoulos et al., 2020). Accordingly, the Indonesian government has placed national energy security as the utmost priority on the national

development agenda, in which enacted in Government Regulation No.79/2014 regarding National Energy Policy (KEN). Concerning the policy, reducing fossil fuel use, especially oil, in minimizing GHG emissions has become one of the main objectives of the National Energy Plan (RUEN) as registered in presidential regulation No.22/2017 (Assia, 2019). The goal is to curtail oil use to less than 25% shares and increase natural gas usage to a minimum of 22% of the total national energy mix by 2025 (RI, 2017).



**Figure 2 Indonesia Primary Energy Mix 2021**

**Source: (DEN, 2022) (Processed)**

The Ministry of Energy and Mineral Resources of the Republic of Indonesia (2022) recorded 1,545 MMBOE on Indonesia's primary energy mix in 2021. According to the statistics acquired, oil accounts for 33.4% of the primary energy mix, with coal (37.6%), natural gas (16.8%), and renewable energy (12.2%) following (DEN, 2022). Consequently, the current composition of primary energy sources, especially the utilization of natural gas, does not align with the intended objectives outlined in RUEN. Hence, considering the government's 2050 targets of reducing oil consumption to below 20% and achieving a minimum of 24% natural gas production, it is imperative to implement a strategic plan to enhance gas output.

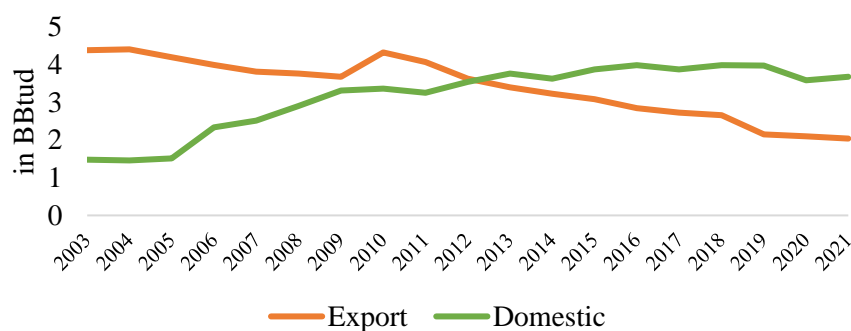
Correlating with the National Energy Plan, the Indonesian government believed that natural gas offers a promising alternative to bridge the energy transition toward decarbonization. This is in view of the fact that natural gas combustion produces fewer emissions than other fossil fuels, particularly oil and coal (Paraschiv & Paraschiv, 2020). Compared to coal, natural gas significantly lowered emissions by 33% less per unit of heat used and 50% fewer emissions based on the usage of electricity (Association, 2019)

On top of that, natural gas is more dependable than oil in terms of availability. During a press release in 2021, Minister Arifin Tasrif outlined the prospect of natural gas compared to oil reserves. Based on the projection, national gas reserves are estimated to run until the next 19.9 years, assuming no new reserves are found. On the contrary, oil reserves are projected will be exhausted in the next 9.5 years (MEMR, 2021). Hence, it is conceivable that natural gas is a readily available alternative

solution that is acceptable and affordable to bridge the energy transition among other fossil fuels.

Although Indonesia’s natural gas reserves offer a lucrative potential in ensuring national energy security, the government has projected a future imbalance between demand and supply, emanating supply disruptions. With the growing economy, the domestic use of natural gas has continually increased by an average of 7.8% annually since 2005 (DCOG, 2019). Conversely, daily natural gas production has been declining by 25% from 3,256 Million Metric Standard Cubic Feet per Day (MMSCFD) in 2011 to 2,433 MMSCFD in 2021 (MEMR, 2022). Accordingly, the Business as Usual (BaU) scenario predicts that Indonesia will have to import 101.1 MTOE of gas in 2050 (DEN, 2019).

In fulfilling the projected national demand and diminishing import needs, the government has decided to confiscate Indonesia from being a gas exporter by 2036 (Umah, 2021). Besides, the government has targeted gas production to reach 12,000 MMSCFD by 2030, equivalent to five times the current production (MEMR, 2021). Hence, to reach this target, understanding the current status of the national gas development is critical, including the natural gas reserves, the supply and demand, government regulation and barriers to development, such as the infrastructures and domestic market and pricing.



**Figure 3 Indonesia's Comparison of Export and Domestic Natural Gas Supply**  
**Source: (SKK, 2021) (Processed)**

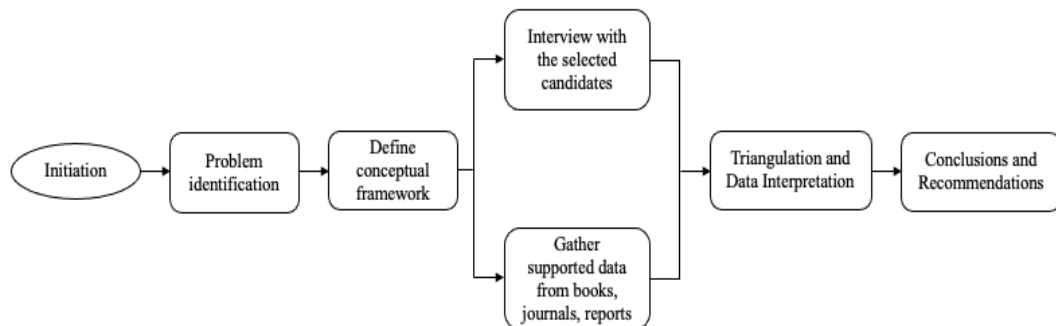
### METHOD RESEARCH

Research plays a vital role in knowledge creation by constructing well-supported arguments based on empirical evidence. Scholars contribute by identifying gaps, proposing alternatives, extending ideas, or replicating studies to validate or challenge existing findings (Daniels & Minot, 2019). Since the 17th century, research design has been an essential component of scientific research, encompassing systematic observation, measurement, experimentation, hypothesis formulation, testing, and modification (Rosenstein, 2019). As a framework, research design guides the collection of data aligned with research objectives and questions, ensuring the acquisition of relevant and reliable information to enhance the validity and reliability of the study.

Beyond the mere presentation of findings, qualitative research employs imaginative data displays to create captivating narratives. It is an interpretive

technique aiming to capture the intrinsic essence of naturally occurring societal events (Ellingson & Sotirin, 2020). By harnessing qualitative methods, researchers can uncover intricate patterns, trends, and motivations that underlie the phenomenon under investigation. The comprehensive and nuanced understanding of qualitative research yields valuable insights for future research endeavors and decision-making processes.

Qualitative research is particularly suited for comprehending the workings and causes behind phenomena, making it an appropriate choice for this study. Hence, this research employs a descriptive qualitative research design to investigate the existence and underlying reasons behind the phenomenon in the gas industry, specifically focusing on developing scenario planning for sustainable gas deliverability business. Data collection involves conducting interviews to gather open-ended responses, enabling an in-depth exploration of participants' experiences and perceptions. Through qualitative research methods, the study aims to comprehensively understand the complex and multi-dimensional nature of the gas industry, identifying patterns, trends, and underlying motivations. This nuanced understanding obtained through qualitative research will provide valuable insights for future research and decision-making processes.



**Figure 4 Research Design**

. These methods include conducting an environmental analysis to evaluate macro and industrial conditions and using content analysis techniques involving categorizing textual data. This analysis facilitates researchers in obtaining a holistic comprehension of the external factors that can impact the business environment, encompassing economic, political, social, and technological aspects.

**RESULT AND DISCUSSION**

**Table 1 VRIO Analysis for KEI**

<b>Parameter</b>	<b>Notion</b>	<b>KEI</b>	<b>Inference</b>
Valuable <i>Fulfilled</i>	The value of the resource is derived from the identification exploitation opportunities.	Natural gas, KEI's primary resource, and value as a transitional energy source in line with the	Temporary competitive advantage

		government's emissions goal.	net-zero
Rare <i>Fulfilled</i>	The presence of a rare resource can lead to competitive advantages and result in market conditions characterized by oligopoly or monopoly.	Strict permits for natural gas companies assess internal resources, fostering a scarcity that promotes monopolistic tendencies.	Competitive parity
Imitate <i>Fulfilled</i>	Hard-to-imitate resources confer competitive advantages due to the high-cost competitors would incur in attempting to develop similar resources.	The natural gas business requires substantial capital, expertise, and risk tolerance beyond the reach of common corporations.	Unused competitive advantage
Organized <i>Unfulfilled</i>	The organization must establish efficient processes and systems to optimize its competitive potential.	The dynamic and unpredictable industry conditions necessitate improvements in organizational structure, systems, processes, coordination, and resource allocation within KEI's operations.	Unused competitive advantage

KEI's primary resource, natural gas, contributes significantly to the government's net-zero emissions goal, providing a temporary competitive advantage. The strict permits in the industry create scarcity, leading to competitive parity for KEI. The capital-intensive and expertise-driven nature of the natural gas business makes it difficult for common corporations to imitate, giving KEI a valuable and hard-to-imitate advantage. However, the dynamic industry conditions highlight the need for improved organizational structure and processes within KEI's operations to unlock its untapped potential for sustainable competitive advantage.

**Table 2 SWOT Analysis for KEI**

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>Established presence in the Indonesian gas industry</li> <li>Strategic location in the Eastern Region of Indonesia</li> <li>Competitive pricing</li> <li>Strong focus on reserves exploration and development</li> <li>Substantial stakeholder relationships</li> <li>Sustainable practices</li> </ul>	<ul style="list-style-type: none"> <li>Declining production from matured reserves</li> <li>Restricted market share in the presence of state-owned enterprises</li> <li>Limited capital investment for operations and explorations</li> <li>Lack of business diversification</li> </ul>
<b>Opportunities</b>	<b>Threats</b>

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<ul style="list-style-type: none"> <li>• Growing demand for natural gas as a transitional energy source</li> <li>• Indonesia gas reserves' potential</li> <li>• Infrastructure development</li> <li>• Strategic partnership</li> <li>• Technological advancements</li> </ul>	<ul style="list-style-type: none"> <li>• Geopolitical risks</li> <li>• Stringent regulatory</li> <li>• Intense market competition</li> <li>• Volatile market prices</li> <li>• Market reluctance to shift to natural gas</li> <li>• Rise of alternative energy sources</li> <li>• Environmental and climate change concerns</li> </ul>
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## 1. Strengths

KEI has established itself as one of the top five gas contractors in the eastern region of the Indonesian gas industry, having operated for over 30 years (Salsabila & Rosyada, 2023). This extensive presence has resulted in acquiring valuable industry knowledge, experience, and relationships. As a result, KEI enjoys credibility and the ability to pursue new opportunities and collaborations within the dynamic Indonesian gas market. Moreover, KEI's strategic location in the gas-rich Eastern Region of Indonesia provides it with convenient access to abundant resources and potential cost efficiencies in gas extraction and transportation (MEMR, 2018). The substantial reserves in this region offer KEI a dependable and sustainable gas supply, enhancing its competitive advantage and long-term growth prospects.

Additionally, acknowledging the constraints arising from depleting production resulting from mature reserves, KEI exhibits a firm dedication to sustaining its competitive edge over rivals through competitive pricing and a robust emphasis on reserve exploration and development (Renassa, 2023). By offering favorable pricing, KEI can appeal to a wider range of customers and secure a larger portion of the market, bolstering its revenue and profitability. Furthermore, the company proactively pursues the discovery of new reserves and embraces cutting-edge technologies to optimize the extraction and development of gas reserves. This proactive approach guarantees a reliable and consistent gas supply, effectively mitigating the impact of declining production and positioning KEI for continuous growth and prosperity within the industry.

In addition, KEI recognizes the importance of nurturing strong relationships with its stakeholders as a key factor in achieving shared success. KEI establishes robust partnerships with customers, suppliers, local communities, and regulatory authorities by cultivating trust, fostering collaboration, and providing support (Suprpto, 2023). These relationships play a vital role in ensuring the smooth functioning of KEI's operations while also creating opportunities for knowledge exchange, access to resources, and shared value creation. Furthermore, KEI places a strong emphasis on sustainable practices and regulatory compliance. The company is acutely aware of its operations' social and environmental impacts and

is committed to responsible conduct (Hatiman, 2023). KEI adheres strictly to regulations and implements sustainable practices to demonstrate its dedication to environmental stewardship and community well-being. This approach aligns with societal expectations and helps KEI build a positive reputation and maintain a competitive edge in the market.

## **2. Weaknesses**

KEI is confronted with several weaknesses that affect its operations and market standing. Primarily, the company faces the obstacle of declining production resulting from matured reserves. As these reserves diminish, KEI struggles to maintain consistent production levels, which hampers its market presence and competitiveness against emerging competitors (Renassa, 2023). Additionally, KEI operates in an industry where state-owned enterprises hold a significant market share (Setiawan et al., 2019). This presents a major obstacle to KEI's efforts to expand and penetrate the market, as it limits the company's access to lucrative contracts and restricts its growth potential. To address these weaknesses, KEI takes a proactive approach by seeking solutions to mitigate the impact of declining production. The company emphasizes reserves exploration and maintains a sustainable supply. KEI also focuses on maintaining competitive pricing to enhance its attractiveness in the market, enabling it to attract a broader customer base and secure contracts.

Furthermore, KEI faces the challenge of limited capital investment for its operations and exploration activities in the gas industry. The industry poses high uncertainty and threats when identifying potential reserves with economically viable value (KT, 2023). As a result, securing the necessary capital becomes a challenging task for KEI. This limitation hampers the company's ability to invest in crucial areas such as exploration efforts, advanced technologies, and infrastructure. Consequently, KEI's competitiveness is hindered, and its potential to seize emerging opportunities and expand into new markets is restricted. In addition to the capital constraints, KEI lacks business diversification, with its primary focus on the gas sector. This narrow focus exposes the company to market volatility risks and gas demand fluctuations.

## **3. Opportunities**

KEI is strategically positioned to seize multiple opportunities within the gas industry. There is a noticeable surge in demand for natural gas as a transitional energy source, propelled by the global emphasis on cleaner and more sustainable energy solutions and the government's commitment to achieving net-zero emissions (IRENA, 2022). This evolving landscape presents a promising opportunity for KEI to meet the escalating demand and expand its customer base by delivering dependable and efficient natural gas services. Additionally, another opportunity lies in the gas reserves potential in eastern Indonesia. The region is rich in untapped gas reserves, allowing KEI to explore and develop new gas sources (Abdul Azizurrofi & Rahmat Firdaus, 2019). By leveraging its established

presence in the east part, KEI can access these abundant reserves and secure a sustainable and diverse gas supply. Furthermore, the infrastructure development initiatives by the government to connect the gas supply from eastern Indonesia to the western region create additional opportunities for KEI. Establishing infrastructure networks and transportation systems facilitates efficient gas distribution, allowing KEI to expand its reach and serve a broader market.

Strategic partnerships can be a valuable opportunity for KEI to boost investment and enhance its capabilities. Collaborating with industry stakeholders, including investors, technology providers, and other gas contractors, can unlock new avenues for growth, foster innovation, and strengthen KEI's competitive position. Lastly, technological advancements present opportunities for KEI to optimize its operations and improve efficiency. By embracing innovative technologies in exploration, extraction, and transportation processes, KEI can enhance productivity, reduce costs, and stay at the forefront of the industry.

#### **4. Threats**

KEI faces significant geopolitical risks in the Indonesian gas industry, directly impacting its operations and market position. Political tensions and conflicts in the company's operating regions expose it to supply chain disruptions and uncertainties that can disrupt business continuity. Political instability, ineffective government regulation, and bureaucratic procedures hinder the industry's growth and development (Dirani & Ponomarenko, 2021). These challenges are exacerbated by a monopolized framework that favors state-owned enterprises, making it challenging for private companies like KEI to navigate regulations and achieve success.

In addition to geopolitical risks, KEI operates within a stringent regulatory environment driven by global energy consumption patterns and emissions targets. The utilization of natural gas is subject to rigorous regulations that align with the government's long-term energy security objectives. Regulatory clarity and transparency remain a persistent challenge, particularly concerning government fiscal incentives. Recent revisions to upstream oil and gas regulations, such as introducing the Gross Split Production Sharing Contract (PSC) and associated tax-related changes, require further clarification. It is vital to clearly understand the profit-sharing system and obligations to instill confidence among investors and facilitate economically viable investments.

KEI operates in a highly competitive market within the Indonesian natural gas industry, contending strong competition from state-owned enterprises, regional-owned enterprises, and private companies. The dominant position of state-owned enterprises, particularly Pertamina, raises concerns about potential monopolistic practices due to its control over the natural gas pipe open access network and the entire value chain (KT, 2023). Additionally, KEI faces significant rivalry in the Eastern region, where emerging competitors with larger reserves threaten its market position (Renassa, 2023). In addition to intense competition,

KEI also faces the challenge of volatile market prices in the gas industry. Fluctuations in gas prices can impact the company's profitability and financial stability, making it difficult to forecast revenues and plan for future investments accurately.

In addition to the challenges posed by geopolitical risks and intense market competition, KEI must also confront the rising threat of alternative energy sources, particularly renewable energy. The growing acceptance and adoption of cleaner energy solutions in the market could reduce the demand for natural gas, posing a risk to KEI's market share and revenue streams. Moreover, environmental and climate change concerns significantly threaten the entire gas industry. Heightened awareness of environmental impacts and the urgent need to mitigate greenhouse gas emissions may result in regulatory changes or shifts in consumer preferences towards even cleaner energy alternatives.

### **Driving Forces**

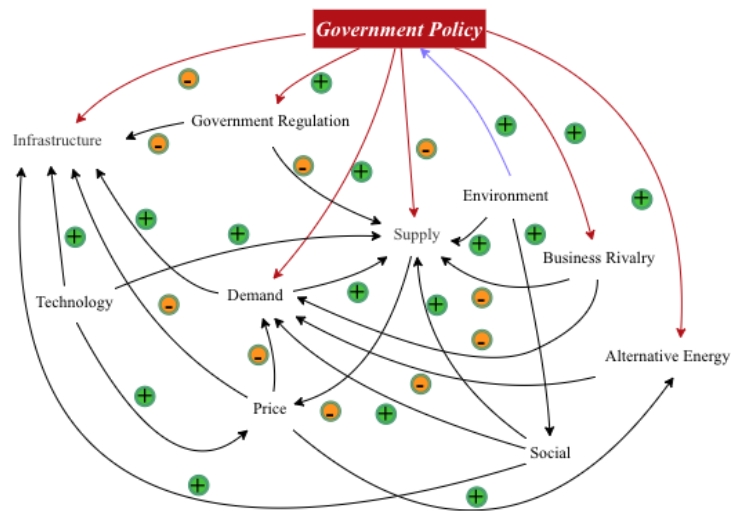
After conducting in-depth interviews with eight industry experts in the gas sector, a comprehensive understanding of the driving forces significantly influencing the industry has been attained. These driving forces encompass various critical factors, including government policy and regulation, the dynamic interplay between supply and demand, pricing mechanisms, the growing prominence of alternative energy sources, infrastructure development, technological advancements, intense business rivalry, environmental concerns, and social factors. Each interviewee provided invaluable insights into the degree of impact and associated uncertainties linked to these driving forces.

**Table 3 Scoring System for Evaluating Impact and Uncertainty Levels**

	<b>Degree of Impact / Degree of Uncertainty</b>			
<b>Remark</b>	N/A	Low	Moderate	High
<b>Scoring</b>	0	1	2	3

A scoring system was employed to assess the relative importance of these driving forces. The priority number, indicating the significance of each driving force, was calculated by multiplying the degree of impact and the degree of uncertainty. The degree of impact and the degree of uncertainty were derived by averaging the points assigned by each interviewee. Points given by the interviewees were based on a carefully designed scale, reflecting varying levels of significance ranging from "Low" to "High". Applying this scoring methodology can give a clearer understanding of the relative importance of the driving forces, identifying and addressing two key uncertainties crucial for future strategic decision-making.



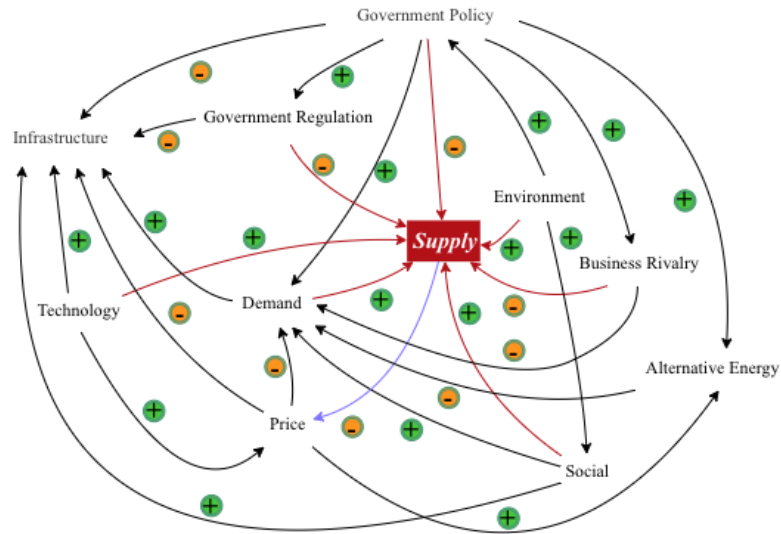


**Figure 6 Government Policy as the Leading Driving Force Shaping Other Factors in the Gas Industry**

The interview findings highlight government policy as the highest priority driving force in the gas industry due to its significant impact and high level of uncertainty. This assessment is further supported by the causal loop diagram, which depicts the crucial role of government policy in shaping the industry. As the most influential factor, government policy has wide-ranging effects on other critical aspects of the system. Government policy can lead to the implementation of stricter regulations, potentially impacting the gas supply. Stringent regulations may hinder gas availability in the market, affecting the entire supply chain. Moreover, government policy directly influences supply through incentives and carbon policies, which can either encourage or discourage gas production and distribution.

It is essential to recognize that government policy also introduces considerable uncertainty to infrastructure development. Establishing and improving infrastructure is essential for ensuring the efficient delivery of gas supply, thus exerting a significant influence on the industry's growth and stability. Furthermore, government policy directly impacts the demand side of the gas industry. For instance, policies promoting gas as a transitional energy source can increase demand. However, government interventions can intensify competition within the gas industry, potentially creating an environment prone to monopolization and discouraging the participation of private-owned companies. Environmental concerns also play a substantial role in shaping government policy in the gas industry. As awareness of environmental issues grows, the government may prioritize alternative energy sources like renewables. This shift towards cleaner energy options could diminish the appeal of natural gas as a fossil fuel, impacting its demand and prospects.

## 2. Supply

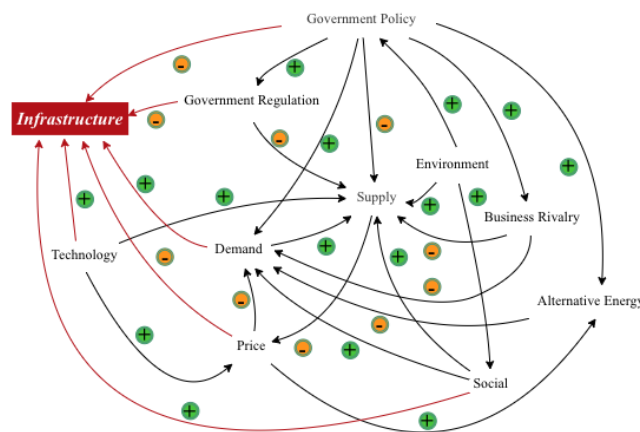


**Figure 2 Gas Supply as the Dominant Driving Force Impacted by Diverse Factors in the Gas Industry**

Based on the interviews, the supply of gas reserves emerged as the second most significant driving force in the gas industry. Gas reserves play a pivotal role in driving business activities and industry growth. However, the gas reserves in Indonesia face significant uncertainty. Currently, most reserves in the country have reached a mature state, while potential reserves are scattered across various regions. This poses several challenges related to infrastructure, technology, and high capital investment, making the extraction and utilization of these reserves economically unviable.

The gas supply in Indonesia is considered the most critical driving force, with many factors influencing it, as depicted in the causal loop diagram. These factors include government policy and regulation, which shape the overall framework for gas supply, as well technological advancements that facilitate efficient extraction, transportation, and distribution. Additionally, the level of demand, business rivalry among industry players, and environmental considerations significantly impact the gas supply dynamics. The interplay of these driving forces creates a complex landscape that requires careful management and strategic decision-making to ensure Indonesia's stable and sustainable gas supply.

### 3. Infrastructure



**Figure.3 Infrastructure as the Dominant Driving Force Impacted by Diverse Factors in the Gas Industry**

Infrastructure emerges as the third highest priority driving force in the gas industry, bringing significant concerns as it plays a critical role in supporting the industry by connecting gas supply with demand. However, several challenges arise due to the geographical disparity between supply and demand, primarily concentrated in eastern and western Indonesia. Establishing fully interconnected gas pipelines remains an ongoing endeavor, hampered by limited optimization. Despite efforts to promote infrastructure development, economic viability issues persist, especially concerning LNG and CNG pipelines. Government policy influences infrastructure through gas distribution regulations governed by PGN, occasionally resulting in monopolistic tendencies.

Additionally, stringent regulations hinder the progress of infrastructure projects. The increasing gas prices further complicate infrastructure development feasibility. Consequently, infrastructure development necessitates strong demand to incentivize the government to enhance infrastructure capabilities and meet growing needs. Moreover, technology and social support are crucial factors in facilitating infrastructure development. Well-developed infrastructure holds immense significance in gas deliverability, as it ensures gas accessibility and enhances industry efficiency.

#### **4. Government Regulation**

Government regulation plays a pivotal role in shaping the gas industry, as evidenced by the interviews, with moderate uncertainty. The impact of government regulation is closely intertwined with government policy, and the stringency of regulations directly affects the gas supply. Regulatory changes can have significant repercussions, often resulting in project delays that diminish economic value, reducing supply and affecting gas prices. Regulatory clarity and transparency remain an ongoing challenge, particularly regarding government fiscal incentives. Recent revisions to upstream oil and gas regulations, including implementing the Gross Split PSC and associated tax-related changes, require

further clarification to establish a stable and supportive operational environment for the industry. Additionally, stringent regulations may impede infrastructure development, posing additional complexities in optimizing the gas industry. Striking a balance between regulation and industry growth is essential for the government to foster an environment conducive to investment and the advancement of the gas sector.

## **5. Environment**

Environmental factors have emerged as a prominent focus among gas industry experts, driven by the growing awareness and commitment to achieving net-zero targets. Natural gas is increasingly recognized as a transitional energy source that can facilitate the transition towards a more sustainable future. Consequently, environmental considerations have become a driving force behind government policies, exemplified by Indonesia's ambitious targets of increasing gas utilization to 23% by 2025 and achieving a capacity of 12,000 MMSCFD by 2030. These targets act as catalysts for optimizing gas supply to meet the rising demand and support the transition to a net-zero emissions economy. The significance of the environment extends beyond public awareness; it also plays a crucial role in encouraging the adoption of gas as a cleaner energy alternative. As environmental concerns gain traction, the demand for gas is expected to rise, creating a positive feedback loop that drives the need for increased supply. This interconnected relationship between environmental awareness, gas demand, and supply optimization underscores the importance of environmental considerations in shaping the dynamics of the gas industry.

## **6. Business Rivalry**

Business rivalry significantly influences the gas industry, with relatively low uncertainty. It is heavily influenced by government policy, particularly in Indonesia, where the gas industry is currently dominated by state-owned enterprises (BUMN). The dominant position of PT Pertamina, which manages the entire natural gas value chain and controls around 70% of the country's natural gas pipe open access network, raises concerns about potential monopolistic practices. The dominance of BUMN in the industry has implications for supply and demand. On the supply side, the monopolistic practices and control exerted by PT Pertamina can hinder the availability and accessibility of gas supply. Furthermore, the influence of BUMN on demand is significant as well, as their decisions and market strategies can shape consumer behavior and market dynamics. The presence of monopolistic practices and limited competition within the gas industry highlights the importance of creating a more level playing field.

## **7. Social**

Environmental concerns strongly influence the social dimension of the gas industry. Currently, there is a reluctance among the general public to embrace gas as an energy source due to ingrained habits and a dependency on fossil fuels such as oil or coal. However, increasing social awareness regarding the importance of

natural gas as a safer and greener energy alternative can significantly impact gas demand. When society recognizes and accepts the benefits of natural gas, including its lower carbon emissions and potential for a cleaner environment, it can drive an increase in demand for gas. This, in turn, creates a positive feedback loop that encourages further investment and development in the gas sector. Social acceptance of gas also plays a critical role in facilitating infrastructure development. When the general public accepts and supports using gas, it creates a favorable environment for constructing gas infrastructure such as pipelines, storage facilities, and distribution networks. A higher level of social acceptance can lead to smoother processes for obtaining permits, securing land rights, and gaining community support for these infrastructure projects.

## **8. Demand**

Government policy, environmental aspects, and social awareness influence the demand for gas in the industry. The commitment to using gas as a transitional energy source, driven by its cleaner and more sustainable characteristics, leads to higher demand. Government policies supporting and incentivizing gas usage and environmental considerations like net-zero targets drive the demand. Social awareness and acceptance also contribute to increased demand, as education campaigns and public outreach promote the positive environmental impact of gas. Challenges to gas demand include business rivalry and competition from alternative energy sources. Rivalry among gas industry players can lead to market inefficiencies and potentially hinder demand growth.

Additionally, the availability of alternative energy sources can influence the demand for gas. The competitiveness and affordability of these alternatives, such as renewable energy, can affect how much gas is sought as an energy option. Gas prices also impact demand, with higher prices reducing demand and lower prices stimulating consumption. As demand for gas increases, it creates a positive feedback loop that promotes supply optimization and infrastructure development. Meeting the rising demand requires optimizing supply capabilities and expanding infrastructure, such as pipeline networks and storage facilities, to ensure a reliable and efficient gas supply.

## **9. Price**

The price of gas is a critical factor influencing various aspects of the gas industry. It is closely tied to gas supply, where a higher supply generally leads to lower gas prices due to increased availability. Conversely, when the gas supply is low, the gas price tends to rise, creating a potential decline in demand as consumers seek alternative energy options that may be more cost-effective. The price of gas also has significant implications for infrastructure development. Higher gas prices can make infrastructure development economically less feasible, as the costs associated with construction, operation, and maintenance outweigh the potential benefits. This, in turn, affects the overall gas supply, as limited infrastructure hinders the efficient transportation and distribution of gas to

consumers. The optimization of matured reserves and exploration of potential reserves require support from advanced technology. While advanced technology can enhance extraction techniques and increase the availability of gas reserves, it often involves substantial investments and operational costs. These expenses can contribute to higher gas prices as the costs of advanced technology are passed on to consumers.

#### **10. Alternative Energy**

The shift towards alternative energy sources is driven by government policies to achieve net-zero emissions and sustainability goals. These policies provide financial incentives and regulatory support for developing and adopting alternative energy, particularly renewable sources. The price of gas also influences the competitiveness of alternative energy, as higher gas prices encourage customers and energy providers to explore cost-saving alternatives. Utilities like PLN may prioritize cheaper energy sources like coal when gas prices are high. The expansion of alternative energy, especially renewables, can lead to a decrease in gas demand, particularly in sectors where alternative options are more viable. The increased availability and affordability of renewable energy make it an attractive choice for those seeking to reduce their carbon footprint and dependence on fossil fuels.

#### **11. Technology**

Advanced technology plays a crucial role in optimizing the gas supply and driving the gas industry's efficiency. It optimizes matured reserves by enhancing extraction techniques and maximizing production from existing fields. Additionally, advanced technology facilitates the exploration and discovery of potential gas reserves, expanding the resource base and ensuring a steady supply for the industry. Furthermore, technology plays a significant role in streamlining and expediting gas industry projects, reducing costs, and improving operational efficiency. However, it is important to note that the advancement of technology can also lead to higher gas prices. Adopting cutting-edge technologies often requires significant research, development, and implementation investments. These costs can be reflected in the overall gas price, potentially impacting consumer demand. Additionally, technological advancements may lead to more sophisticated and complex infrastructure requirements, necessitating substantial investments in infrastructure development.

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In the next five years, the Indonesian gas industry's outlook will be influenced by various driving forces, including government policies, gas supply dynamics, infrastructure development, government regulations, environmental considerations, industry competition, societal factors, energy demand trends, pricing fluctuations, advancements in alternative energy sources, and evolving technologies. These factors will shape the sector's sustainability and profoundly impact Kangean Energy

Indonesia (KEI) as a gas contractor. Excelling amidst these future challenges will require a strategic approach that addresses these key focal issues and leverages opportunities presented by the changing landscape of the natural gas business in Indonesia. Gas supply is a fundamental uncertainty, influenced by the maturity of existing gas reserves and the scattered potential reserves across different regions. This raises concerns about ensuring a sustainable and reliable gas supply, necessitating significant investments in technology and infrastructure. Infrastructure arises as another critical uncertainty, with challenges in establishing fully interconnected gas pipelines to optimize distribution across the country, especially in eastern and western Indonesia. Economic viability issues further complicate infrastructure development, particularly for LNG and CNG pipelines within the industry. 2. The potential scenarios for Indonesia's natural gas delivery business arise from the interplay of two critical uncertainties: gas supply and infrastructure development

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