

# SCENARIO PLANNING FOR PT BANGGAI LNG'S BUSINESS STRATEGY TO FACE FUTURE LNG INDUSTRY CHALLENGES

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**Abstract-** The liquefied natural gas (LNG) industry is undergoing significant transformation due to fluctuating global demand, the transition to renewable energy, and evolving regulations. PT Banggai LNG (PT BLNG), a key player in Indonesia, leverages its strategic location and advanced infrastructure to meet domestic and international demand. However, PT BLNG faces market volatility, intense competition, and increasingly complex environmental regulations. This research employs scenario planning to help PT BLNG develop business strategies to address challenges in the LNG industry, utilizing PESTEL analysis, Porter's Five Forces, VRIO framework, and SWOT analysis. These analyses highlight regulatory pressures, competition, limited resources, and regional demand opportunities. Four strategic scenarios were developed: "Stable but Limited Growth," "Emerging Markets," "Challenging Markets," and "Profitable but Constrained Markets." Proposed strategies include cost optimization, infrastructure development, and market diversification. With early warning signals, a five-year roadmap, and the four strategic scenarios, PT BLNG is expected to adapt to uncertainties, align with global energy trends, and sustain its long-term competitiveness in the LNG industry in Indonesia and the surrounding region.

**Keywords:** Business Strategy; Liquefied Natural Gas; Scenario Planning

## 1. INTRODUCTION

The need for energy in the world has shown an increasing trend every year, in total reaching around 160,000 terawatt hours in 2021 (Our World in data, 2021). Today, fossil fuels are still the main source of most of the world's energy needs. There are three types of fossil fuels that are most widely used, namely, oil, coal and natural gas. Natural gas is an alternative energy source that has been widely used in the world and its demand continues to increase. Natural gas is a type of fuel that has the advantage that it is more environmentally friendly and most efficient than other fossil fuels. Burning natural gas emits significantly less carbon dioxide (CO<sub>2</sub>) than coal or oil. Specifically, it produces about 50% to 60% less CO<sub>2</sub> than coal when used in power plants (MET Group, 2020).

The method of delivering natural gas from natural gas sources to natural gas users can be done in two ways, namely through a gas pipeline or by liquefying it into Liquefied Natural Gas (LNG). The choice of natural gas delivery method is strongly influenced by the distance of delivery from the gas source to the user's location and the large volume of gas delivered. Most of the unexplored natural gas reserves are located far from natural gas users, and it is not possible to transport it through gas pipelines. In liquid form, natural gas can be transported in large volumes across national borders and even continents by specialized LNG carriers (Rahardjo, 2015). So, LNG will play a key role in fulfilling future natural gas demand. It is

estimated that global demand for LNG will increase by more than 50% by 2040, driven largely by industrial sectors switching from coal to gas (Shell, 2024).

In Indonesia, natural gas production shows a decreasing trend (BP, 2022). According to the Handbook of Energy & Economic Statistics of Indonesia, 2021, total gas production from associated gas and non-associated gas types of fields in 2021 decreased from 3.1 million MMSCF in 2015 to 2.4 million MMSCF. The natural gas reserves also show a decreasing trend. Total reserves of natural gas in 2021 decreased from 151.33 TSCF in 2015 to 60.61 TSCF (MEMR – HEESI, 2021).

Until 2021, there are three national LNG plants, namely the Badak LNG Plant in Bontang (eight trains) Kalimantan with a total installed capacity of 21.64 million metric tons/year, the Tangguh LNG plant with a total installed capacity of 7.6 million metric tons/year and Donggi Senoro LNG plant with a total installed capacity of 2.0 million metric tons/year. However, since 2014, the Arun LNG plant has ceased to operate because gas supplies from Sumatra and its surroundings are no longer in production (Putra, 2022).

According to data provided by IHS Markit, 2022, Indonesia's LNG demand will grow significantly, especially after the year 2033. It means that uncontracted domestic LNG production is likely to be allocated for domestic consumption to stall the need to tap the international markets. Currently, the LNG Sales Purchase Agreement (“SPA”) is dominated by domestic LNG SPA instead of international LNG SPA (IHS Markit, 2022).

PT BLNG is the first Indonesian LNG project developed as a "downstream business activity" located in Central Sulawesi, which enables separate development of upstream (feedstock gas supply) and downstream (LNG manufacturing) businesses, including selling LNG to the international and domestic markets.

PT BLNG produces two million tons of LNG annually, delivering 38 to 42 cargoes per year under long-term contracts with international buyers, which will expire in 2027, along with the Gas Sales Agreement (GSA) from upstream parties. To ensure continuity, PT BLNG must renegotiate with buyers to extend contracts. However, it faces pressure to lower prices due to competition from global LNG producers offering larger volumes and more competitive rates. Additionally, PT BLNG must secure new gas allocations from the Government of Indonesia (GOI) and extend its GSA with upstream suppliers, as some buyers are offering higher prices directly to these suppliers, potentially reducing the gas volume available to PT BLNG.

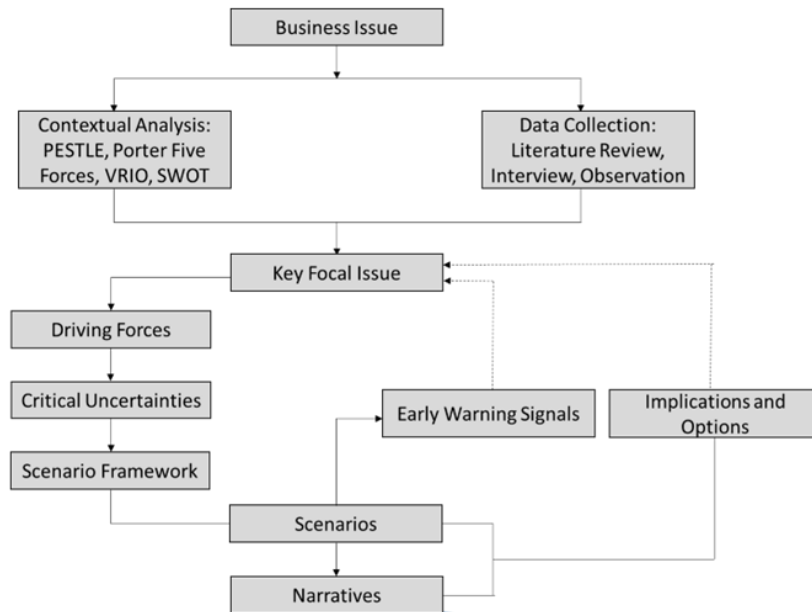
Domestically, the GOI has urged LNG producers to prioritize local demand (Reuters, 2022), particularly for power plants, where prices are regulated and less attractive than international markets. This creates a dual challenge for PT BLNG: maintaining profitability while meeting domestic supply obligations and competing internationally.

Based on the current situation above, PT BLNG should determine the right strategy, especially post-2027, to remain sustainable and competitive with other LNG producers and also to accommodate the GOI's request to supply the domestic market without causing a loss in terms of sales. The author uses the scenario planning method to develop the strategy.

## 2. RESEARCH METHODOLOGY

This research employs two theoretical frameworks to address the business issue: scenario planning and business strategy. Scenario planning involves generating multiple potential future scenarios based on various hypotheses and uncertainties, with an analysis of each scenario's possible outcomes. To develop the scenario planning, the research uses the PESTEL analysis. To develop the business strategy, this research uses SWOT analysis, Porter's five forces to analyze the external factors, and VRIO to analyse the internal factors of the company.

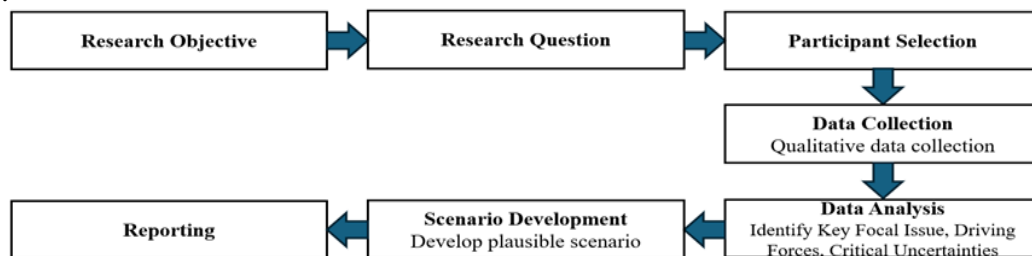
The conceptual framework that will be used in this research is as follows:



**Figure 1 Conceptual Framework**  
*Source: Garvin and Levesque, 2006*

This scenario planning research starts with the business issue that is supported by the research objective. After the objective is stated, the parallel phase of contextual analyses and data collection are conducted to identify the environments of the Company. For the contextual analysis, the Author used PESTLE and Porter’s Five Forces as the external analysis and VRIO and SWOT for the internal analysis. For data collection, the Author used a literature review, conducted the interview, and observation. Further, the result of the analysis gives a key focal issue that will be discussed in scenario planning to develop a conclusion and implementation plan for the Company.

This research is using qualitative method which using a variety of data collection techniques and analytical procedures. A qualitative research design may use a single data collection technique, such as semi-structured interviews, and corresponding qualitative analytical procedure (Saunders et al., 2020). Research design is also defined as a blueprint for achieving research objectives by providing a procedural plan of research activity focused on the research question, guiding the selection of information sources, and providing the research framework. Qualitative method that provides the opportunity for faster turnaround of results with smaller sample sizes and is useful for supporting low-risk decisions that need to be made quickly (Schindler, 2021). The research design used in this research is shown in Figure 2.2 below.

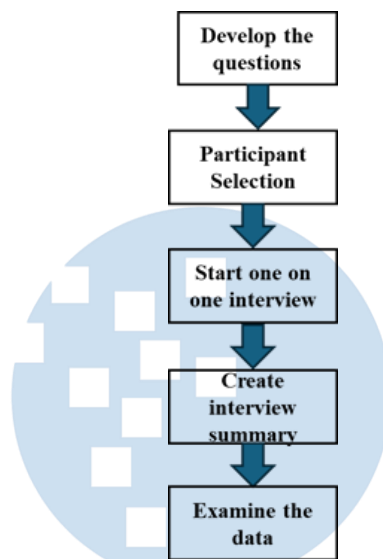


**Figure 2. Research Design**  
*Source: Author’s Analysis*

Data Collection Methods are strategies to systematically measure variables and collect data. Data Collection methods provide the chance to learn about research problem firsthand and to develop original thoughts (Bhandari, et.all., 2023).

Qualitative data will be used in the analysis, as this research approach allows the author to gain a deeper understanding and explore the hypotheses. The qualitative data was obtained through in-depth interviews with external stakeholders, such as regulators, government officials, and industry representatives, as well as the top management and internal of PT BLNG.

According to Saunders et al. (2020), an in-depth interview is used to explore a general area of interest in depth. Which in this research the interview are aim to define driving forces and critical uncertainty in LNG industry. The author's preparation for an in-depth interview will be the following:



**Figure 3. Interview Process**

*Source: Author's Analysis*

a. **Develop the questions**

The objective is to collect a variety of perspectives and viewpoints from different stakeholders within and outside the organization. This diversity can lead to a more comprehensive and well-rounded set of scenarios, as it considers various angles and potential outcomes. Additionally, the aim is to identify the major drivers and uncertainties that could significantly impact the LNG industry in the future.

**Table 1. List of Questions**

No	Objective	Question List	Code
1	Understanding the current LNG Industry in Indonesia	What do you think about the LNG Industry in Indonesia right now?	Q1
2	Understanding what political aspects affect the LNG industry in Indonesia	What is your opinion regarding the political aspects affecting the LNG industry?	Q2
3	Understanding what economic aspects affect the LNG industry in Indonesia	What is your opinion regarding the economic aspect of the LNG industry?	Q3
4	Understanding what social, technological, legal, and environmental aspects affect the LNG industry in Indonesia	What is your opinion regarding the social, technological, legal, and environmental aspects affecting the LNG industry?	Q4

No	Objective	Question List	Code
5	Understanding what driving forces should be considered to sustain the business in the next 5 years.	What driving forces should be a concern to sustain its business in the next 5 years?	Q5
6	Understanding which two critical factors have high uncertainty, and also have a great impact on the LNG industry	Based on your view, which two factors that you think is the critical aspect that has high uncertainty, and also has a great impact on the LNG industry?	Q6
7	Understanding why the factors become so critical	Can you explain why the factors become so critical?	Q7
8	Understand the outlook of the LNG industry to address challenges in the next 5 years	What is your insight regarding the LNG industry to overcome the challenge in the next 5 years?	Q8
9	Understanding what PT BLNG's strengths, weaknesses, opportunities and threats are to the LNG industry.	[For Internal PT BLNG] Based on your view, what are the strengths, weaknesses, opportunities, and threats of PT BLNG on the LNG industry?	Q9

b. Participant collection

Participants were selected by the author from internal and external organizations that are related to the LNG industry. A total of 6 participants were selected to participate in the interview, representing various fields, competencies, and different industry sectors, which was expected to provide broad insights into the author's research needs, as shown in Table 2.2.

**Table 2. Profiles of the Participants**

Code	Initials	Position	Level of Position	Name of Company	Experiences	Company Category
P1	BM	Operation Director	Top Management	PT BLNG	33 years	National O&G Company
P2	RA	Marketing and Sales General Manager	Middle Management	PT BLNG	14 years	National O&G Company
P3	TAN	Business Development Analyst	Analyst	PT BLNG	17 years	National O&G Company
P4	AB	General Manager of the Gas seller	Middle Management	JOB PMTS	32 years	National O&G Company
P5	RF	Coordinator of Oil and Gas Program Preparation	Middle Management	Indonesia's MEMR	18 years	Ministry Representative
P6	HJS	Business Development Director	Top Management	PT National Energy Solutions ("PT NES")	12 years	LNG Buyer

c. Start one on one interview

The interview is conducted via an online meeting using a semi-structured format.

The author will begin with specific questions based on a prepared template.

d. Create an interview summary

- After conducting interviews, the author creates a summary of each interview.
- e. Examine the data  
Based on the summary, the author examines the data to be used as the basis for creating scenario planning.

This research is using content analysis to analyze data collection. Content analysis is used in qualitative research with written or recorded materials drawn from personal expressions of participants, behavioral observations, debriefing of data collectors, and trace evidence from the physical environment of participant interaction. Content analysis is analyzing the common phrases and words, context, and patterns of expression among the participants that provide the qualitative picture of the participants (Schindler, 2021).

### 3. RESULTS AND DISCUSSION

This research involves scenario planning analysis and an examination of all acquired data to determine the facts and findings, with the aim of developing a business solution. Internal analysis includes VRIO (Valuable, Rarity, Imitability, Organization) Analysis, and SWOT analysis. External analysis, including PESTEL analysis, and Porter's Five Forces analysis, will provide an understanding of external issues affecting the organization.

Based on data collection and in-depth interviews with the respondents, this research analyses each element that influences the LNG industry in Indonesia using PESTEL analysis. The research will then examine scenario planning analysis, which is a tactical approach to developing adaptable long-term plans.

#### 3.1 External Factor Analysis

External factor analysis will be using PESTEL and PORTER's Five Forces analysis to address opportunities and threats in the organization's external environment.

##### 3.1.1 PESTEL Analysis

The following is a summary of the highlights of the factors and events relating to the LNG industry in Indonesia using PESTEL Analysis:

- a. Political factors: The regulation from GOI regulates the implementation of LNG supply and infrastructure development as well as the conversion of high-speed diesel (HSD) fuel use to LNG in the provision of electricity.
- b. Economic factors: global LNG prices, currency exchange rates.
- c. Social factors: community relations, local employment, and CSR programs.
- d. Technological factor: CCS technology to reduce carbon emissions.
- e. Environmental factor: LNG as a cleaner energy compared to fuel oil.
- f. Legal factors: Environmental laws, including those related to emissions, water usage, and waste management.

##### 3.1.2 Porter's Five Forces Analysis

In this analysis, the author applies this framework to evaluate the appeal of Indonesia's current LNG industry, as follows:

- a. The bargaining power of suppliers is high. PT BLNG is really dependent on only two gas suppliers, namely JOB PMTS and PEP.
- b. The threat of new entrants is moderate. The threat of new entrants for PT BLNG is moderate, contributing to high capital requirements, regulatory and environmental hurdles, established market players, and technological expertise.

- c. The bargaining power of buyers is high. Nowadays, the LNG price formula for long-term contracts tends to decrease because some LNG producers have a big volume and can offer lower prices. Thus, the bargaining power of buyers is high because there are a large number of LNG suppliers.
- d. The threat of substitute products or services is low because LNG buyers cannot substitute their supply product with other energy supplies.
- e. The rivalry among existing competitors is moderate. While there is competition within Indonesia's LNG industry, PT BLNG has a unique positioning, secured contracts, and a targeted market approach.

### 3.2 Internal Factor Analysis

#### 3.2.1 VRIO Analysis

Conducting a VRIO analysis for PT BLNG involves evaluating the company's resources and capabilities to determine their potential for providing a sustained competitive advantage in the context of Indonesia's LNG industry. The analysis is as follows:

- a. Value: Strategic position in Indonesia's LNG industry, LNG facility infrastructure, and also economic impact from PT BLNG to support regional economic growth. In conclusion, PT BLNG is high value because PT BLNG's assets and capabilities create substantial economic and strategic value for Indonesia's LNG industry.
- b. Rarity: partnership stakeholders from multinational companies, geographic location, and gas source, and also exclusive long-term contracts with large international LNG buyers. Based on these, PT BLNG has a high rarity. PT BLNG's unique ownership structure, exclusive access to gas reserves, and secure sales contracts position it as a rare entity within the Indonesian LNG sector.
- c. Imitability: high capital and technological barriers, Indonesia's regulatory environment in the energy sector, and PT BLNG's relationships with local stakeholders and regulators. The high cost, regulatory barriers, and expertise required make it challenging for competitors to replicate PT BLNG's operational model. In conclusion, PT BLNG is difficult to imitate.
- d. Organization: PT BLNG's strategic alliances, technological implementation, and alignment with governmental goals indicate a well-structured organization capable of fully capitalizing on its resources. Based on these explanations, PT BLNG's strategic alliances, technological implementation, and alignment with governmental goals indicate a well-structured organization capable of fully capitalizing on its resources. It means that PT BLNG is well-organized.

#### 3.2.2 SWOT Analysis

SWOT analysis is a framework for identifying and analyzing the internal strengths and weaknesses, as well as the external opportunities and threats. It is used to evaluate a company's competitive position and to develop strategic planning (Kenton, 2021). SWOT analysis for PT BLNG can be summarized in Table 3.1 below.

**Table 3. SWOT Analysis**

Strengths	Weaknesses
<ol style="list-style-type: none"> <li>1. First Indonesian LNG project developed as a "downstream business activity".</li> <li>2. Expert in the LNG production business.</li> </ol>	<ol style="list-style-type: none"> <li>1. Small capacity of LNG plant compared to other LNG producers in Indonesia. PT BLNG only has one single train, jetty, and terminal (P1) (P2)</li> <li>2. Dependence on specific gas fields</li> </ol>

<ol style="list-style-type: none"> <li>3. Well-known LNG plant in Indonesia and globally, has a good reputation LNG seller and reliable production (P2), (P3).</li> <li>4. Solid feed gas (P3)</li> <li>5. Strategic location in East Indonesia</li> <li>6. Experienced human resources and good technical skills.</li> <li>7. Supported by strong stakeholders (P1)</li> <li>8. Lean organization, but generate high profit (P1), (P2).</li> <li>9. Has a good project arrangement with profitable GSA and LNG SPA (P3)</li> </ol>	<ol style="list-style-type: none"> <li>3. LNG terminal does not support small vessels.</li> <li>4. Many laborers are recruited from outside so the rate is different from local laborers (P1)</li> <li>5. Consist of some shareholders that impact political decision-making (P2)</li> </ol>
<b>Opportunities</b>	<b>Threats</b>
<ol style="list-style-type: none"> <li>1. Global and domestic LNG demand is growing (P2)</li> <li>2. Opportunity to develop LNG on a small scale, especially for the domestic market in Eastern Indonesia (P3)</li> <li>3. LNG will be the transition energy toward the Net Zero Emission (NZE).</li> <li>4. Government regulation on power plants related to the conversion of diesel to gas using LNG</li> <li>5. Gas allocation for the next phase operation after 2027 (P1), not only for the international market but for the domestic (R2).</li> <li>6. Downstream scheme makes commercial deals easier (R2)</li> <li>7. New gas field sources can increase PT BLNG's allocation (R2)</li> </ol>	<ol style="list-style-type: none"> <li>1. Cheaper LNG price from an international competitor</li> <li>2. Global oversupply</li> <li>3. LNG price for domestic demand, especially for PLN, is regulated by the GOI, not the “B to B” scheme.</li> <li>4. Gas allocation from the GOI could be limited only for the short term, for example, only 5 years (P2), (P3).</li> <li>5. Carbon Tax implementation</li> <li>6. The request for gas allocation after 2027 is not only from PT BLNG but also from other companies (P1)</li> <li>7. Risk of price review with buyers that impact to the lower LNG price (R2).</li> <li>8. Export and Import Policy from the GoI (R3).</li> <li>9. The volatility of the LNG spot market price.</li> </ol>

*Source: Author’s analysis and based on interviews with participants*

### 3.3 Scenario Planning Development

The first step of scenario planning development is to define the key focal issue. In this research, the key focal issue that became the basis of scenario planning development is “How will the LNG industry in Indonesia in the next five years?”.

The second step of scenario planning is to investigate and categorize the driving forces. These driving forces encompass a range of factors, situations, and strategies that have the potential to impact, influence, and shape the key focal issue.

After conducting the interviews with participants, a total of fifteen (15) driving forces have been identified that have the potential to propel the oil and gas industry towards a cleaner energy environment. These driving forces span across various domains, including political, economic, social, technological, environmental, and economic aspects. Their collective influence will play a crucial role in shaping the trajectory and outcomes of the LNG industry in Indonesia moving forward. The details of the driving forces for facing future challenges in Indonesia’s LNG industry and their sources are further explained in Table 3.2 below.



**Table 4. Key Driving Forces**

No	Category	Key Driving Forces	Interview Content Analysis
1	Political	Government Regulation	<p>From the interviews, there are two participants (P2 and P4) that highlight about government regulation related to specific natural gas pricing policy that affect the LNG industry in Indonesia. The specific gas price, which is US\$6.00/MMBTU, is very affecting the LNG value chain cost from upstream to midstream. With this regulation, there must be intervention from the Government to regulate prices from upstream to midstream part so that the economics remain reasonable.</p> <p>The participant P4 from Indonesia's MEMR emphasized that the specific natural gas pricing to increase the competitiveness in the LNG/gas industry.</p> <p>Government regulatory policies are necessary for the sustainability of the LNG business in Indonesia.</p> <p>From the interviews, there are two participants (P1 and P2), that highlight about government regulation related to the gas allocation regulation that affect the LNG industry in Indonesia.</p> <p>P2 emphasized that the gas allocation from the government must be clear on who gets the allocation from the government for domestic use. For now, only fertilizers and PLN.</p>
		Firmness in the regulation of fuel oil to gas conversion	<p>From the interviews, there are two participants (P5 and P6), that highlight about the regulation of fuel oil to gas conversion.</p> <p>P5 observed that the government is less assertive in the conversion of fuel to gas, due to many interests. Importers play a lot in diesel fuel.</p>
2	Economic	Price – (Willingness to Pay)	<p>From the interviews, there are four participants (P1, P2, P5, and P6) that highlight the willingness to pay the LNG price from the industry that affects the LNG industry.</p> <p>The participants emphasized that the purchasing power of the industry has not been able to meet the LNG price of the LNG producer. P2 added that investment in the LNG business must look at the purchasing power of the industry/buyer.</p>
		Big investment in LNG business	<p>From the interviews, there are two participants (P2, and P3), that highlight about the big investment in LNG business that affecting the LNG industry.</p> <p>P3 emphasized that LNG businesses like gambling need big investments but are very risky if there is no uncertainty of price regulation from the government.</p>
		Luxury Price of LNG	<p>From the interview, there is one participant (P3) that mentioned that the luxury price of LNG. It means that there is additional cost to liquify the gas and regasification cost at the Buyer's plant. Therefore, the LNG price is become luxury.</p>

No	Category	Key Driving Forces	Interview Content Analysis
		Financing	<p>From the interview, there is one participant (P5) that highlights about the financing that affect the LNG industry.</p> <p>P5 emphasized that the LNG industry is a long-term project and requires considerable capital. Thus, funding from lenders is needed to be able to engage in the LNG industry. Funding support from domestic banks to LNG producers or consumers is needed so that the LNG industry can continue to be sustainable.</p>
3	Social	Local labor absorption	<p>From the interviews, there are three participants (P1, P5 and P6), that highlights about the local labor absorption with the LNG project in their area.</p> <p>The presence of an LNG project in an area will result in a multiplier effect in the area. However, (P1) and (P5) opined that the labors skills are still unable to balance skill from the external labors. Therefore, it is necessary to have a technical school built by the local government to provide education and training for local community</p>
		CSR program	<p>From the interviews, there is one participant (P1) that highlights about the CSR program related to the LNG industry.</p> <p>(P1) emphasized that CSR program is needed to maintain the good relationship with the local community and also to provide symbiotic mutualism between the company and local community, such as infrastructure, healthcare, education, and environmental initiatives.</p>
4	Technological	Small scale LNG	<p>From the interviews, there are two participants (P2, P4) that highlight the small-scale LNG that affects the LNG industry.</p> <p>(P2) emphasized that LNG technology has progressed, for example, with small-scale LNG. Currently, LNG is not only used in power plants, but has entered the industry using iso tanks, and also hotels.</p>
		CCS technology	<p>From the interviews, there are two participants (P3, P6) that highlight the CCS technology that affects the LNG industry.</p> <p>With growing pressure to reduce carbon emissions, CCS technology is becoming increasingly important in LNG production. By capturing and storing CO<sub>2</sub> emissions from the LNG process, companies can meet stricter environmental regulations and align with Indonesia's commitment to lowering carbon emissions.</p>
5	Environmental	Green Energy and Low Emission	<p>From the interviews, four participants (P1), (P2), (P4), and (P5) highlight that green energy and low emission are the key driving forces of using LNG that relate to the environment.</p> <p>(P4) emphasized that the government is striving to achieve net zero emissions. Emissions from gas are relatively cleaner and gas is most appropriate as a bridging towards net zero emissions.</p>
6	Legal	Legal Aspect with Lenders	<p>From the interview, there is one participant (P1) that highlights about the legal aspect with the lenders. (P1)</p>

No	Category	Key Driving Forces	Interview Content Analysis
			emphasized that PT BLNG must comply with the legal aspects with the lenders.
		Long-term commitment from Domestic Buyer	(P1) emphasized that the domestic players from the legal side must dare to commit to the long term. Therefore, the use of LNG for domestic use can be maximized.
		LNG Import Regulation	From the interviews, two participants (P2), and (P5) highlight that LNG import regulation is very important for the sustainability of domestic LNG producers. (P5) emphasized that for now, there is no need to import LNG. Fuel imports should be reduced so that LNG use increases.
		International Carbon Trading	From the interview, one participant (P6) highlight International Carbon Trading is one of the legal aspect that affect LNG industry. International carbon trading should be considered a key driving force due to its significant influence on global business strategies, regulatory landscapes, and competitive positioning, particularly in carbon-intensive industries.

The next step is to identify the critical factors, by assessing the level of uncertainty and impact on the key focal issue. The participants defined the degree of uncertainty and degree of impact during the interview session.

Based on the interviews with the participants, each participant expressed what factors have the most critical impact and high uncertainty based on the driving forces stated earlier in Table 3.2 above. Then, the author summarized the interviews to determine the two main drivers. The summary data of the participants is as follows:

**Table 5. Summary of Interview**

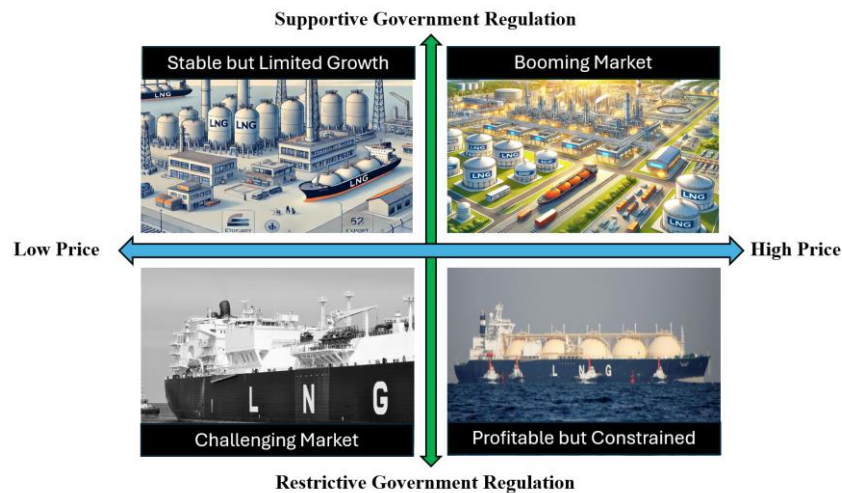
Participant Code	Critical Impact and High Uncertainty	
P1	<b>Government Regulation</b>	<b>Price</b>
P2	Customer Demand	<b>Price</b>
P3	<b>Government Regulation</b>	<b>Price</b>
P4	LNG Infrastructure	<b>Price</b>
P5	LNG Infrastructure	Financing
P6	<b>Government Regulation</b>	<b>Price</b>

According to the interview results, “**Government Regulation**” is a critical factor, while “**Price**” is a highly uncertain factor.

### 3.3.1 Scenario Framework

As already mentioned in the previous stage, two most critical impact and high uncertainties are: “Government Regulation” and “Price”. These two mains drivers are then plotted in two cross axes, with the horizontal axis showing “Price”, and the vertical axes showing "Government Regulation". There are then four scenarios developed in each quadrant. These scenarios are:

1. Stable but Limited Growth
2. Booming Market
3. Challenging Market
4. Profitable but Constrained



**Figure 4. Scenario Creation in 2x2 Matrix Based on the Identified Critical Uncertainties**  
*Source: Author's Analysis*

### 3.4 Business Solution

After creating the four narratives of the scenario, the author identified the implication and developed the options for each scenario. The purpose of identifying the implication is to identify the opportunity, challenges, and potential risks that might occur in the future. On the other hand, the options of each scenario were developed for PT BLNG to face the challenges in the future. The implications and options for each scenario are as follows:

**1) Scenario Narrative 1: Stable but Limited Growth (Low Price & Supportive Government Regulation)**

**Table 6. Implications and Options of Stable but Limited Growth**

Category	Implications	Options
Financial Performance	<ul style="list-style-type: none"> <li>- Moderate revenues due to low LNG prices.</li> <li>- Reliance on government subsidies and tax incentives for viability.</li> </ul>	<ul style="list-style-type: none"> <li>- Enhance operational efficiency to reduce costs.</li> <li>- Obtain government backing to maintain subsidies and tax incentives.</li> </ul>
Market Dynamics	Focus on domestic markets with lower prices compared to exports.	Strengthen relationships with domestic buyers (e.g., power plants, industrial users).
Operational Adjustment	Operations focused on stability and efficiency rather than growth	Invest in advanced technologies for cost reduction and operational efficiency.

*Source: Author's analysis*

**2) Scenario Narrative 2: Booming Market (High Price & Supportive Government Regulation)**

**Table 7. Implications and Options of Booming Market**

Category	Implications	Options
Financial Performance	<ul style="list-style-type: none"> <li>- High revenues driven by strong global and domestic LNG demand.</li> <li>- High profit margins due to favorable pricing and reduced financial constraints.</li> </ul>	<ul style="list-style-type: none"> <li>- Increase production capacity to accommodate growing demand.</li> <li>- Allocate profits toward infrastructure improvements and technological innovations.</li> </ul>

Category	Implications	Options
Market Dynamics	<ul style="list-style-type: none"> <li>- Significant international demand from key markets (e.g., Asia).</li> <li>- Favorable export environment with minimal government restrictions.</li> </ul>	<ul style="list-style-type: none"> <li>- Establish long-term export agreements with high-value international buyers.</li> <li>- Broaden market presence by targeting emerging regions with increasing LNG demand.</li> </ul>
Operational Adjustment	Full-capacity operations to maximize revenue.	Enhance production facilities to improve efficiency and increase output capacity.

Source: Author's Analysis

### 3) Scenario Narrative 3: Challenging Market (Low Price & Restrictive Government Regulation)

**Table 8. Implications and Options of Challenging Market**

Category	Implications	Options
Financial Performance	<ul style="list-style-type: none"> <li>- Thin profit margins due to persistently low LNG prices.</li> <li>- High regulatory compliance costs (e.g., carbon taxes, environmental standards).</li> </ul>	<ul style="list-style-type: none"> <li>- Reduce operational expenses by enhancing efficiency and optimizing resource utilization.</li> <li>- Ensure financial stability by renegotiating terms with suppliers.</li> </ul>
Market Dynamics	<ul style="list-style-type: none"> <li>- Depressed global LNG demand because of oversupply and competition from renewables energy.</li> <li>- Government mandates prioritize domestic supply over exports.</li> </ul>	<ul style="list-style-type: none"> <li>- Prioritize fulfilling domestic energy requirements to ensure a stable demand base.</li> <li>- Target specialized international markets with lower price sensitivity to sustain export activities.</li> </ul>
Operational Adjustment	Reduced production due to low demand and high costs.	Optimize operations by shutting down underutilized facilities.
Diversification and Innovation	Risk of being unprepared for long-term energy transition trends and stricter future regulations.	Develop small-scale LNG for industrial and transportation use.

Source: Author's Analysis

### 4) Scenario Narrative 4: Profitable but Constrained (High Price & Restrictive Government Regulation)

**Table 9. Implications and Options of Profitable but Constrained**

Category	Implications	Options
Financial Performance	<ul style="list-style-type: none"> <li>- High revenues driven by strong global demand and high LNG prices.</li> <li>- Increased operational costs due to regulatory compliance (e.g., carbon taxes, DMO).</li> </ul>	<ul style="list-style-type: none"> <li>- Streamline operational expenses to maintain profitability.</li> <li>- Efficiently allocate resources to support compliance and environmental initiatives.</li> </ul>
Market Dynamics	<ul style="list-style-type: none"> <li>- Strong export demand, but restrictive policies limit the volume of exports.</li> <li>- Domestic market obligations (DMO) prioritize local supply, reducing export potential.</li> </ul>	<ul style="list-style-type: none"> <li>- Prioritize high-value export contracts to maximize revenue from restricted export capacity.</li> <li>- Build stronger partnerships with domestic buyers to maintain consistent local demand.</li> </ul>
Operational Adjustment	- Full-capacity operations to meet both domestic obligations and export demand.	Allocate resources to technologies that reduce emissions and ensure environmental compliance.

Source: Author's Analysis

### 3.5 Early Warning Signals

Scenarios assist in determining the trajectory of the environment. Establishing an early warning system allows for monitoring and analyzing potential future developments, helping to identify which scenario the company is aligning with. This final project highlights government regulations and price as key uncertainties. The early warning signal for each scenario is displayed in Table 3.8 below:

**Table 10. Early Warning Signals for All Scenarios**

Indicators	Stable but Limited Growth	Booming Market	Challenging Market	Profitable but Constrained
Incentives for LNG industry	<ul style="list-style-type: none"> <li>- Sustained subsidies to support LNG production.</li> <li>- Increased government assistance for operational sustainability.</li> </ul>	<ul style="list-style-type: none"> <li>- Additional export tax incentives or subsidies announced.</li> <li>- Streamlined environmental and compliance procedures.</li> </ul>	<ul style="list-style-type: none"> <li>- Reduction or removal of LNG-related subsidies.</li> <li>- Discontinuation of tax incentives for LNG companies.</li> </ul>	<ul style="list-style-type: none"> <li>- Tightened restrictions on eligibility for tax incentives.</li> <li>- Decreased support for specific LNG activities.</li> </ul>
Carbon taxation and compliance	<ul style="list-style-type: none"> <li>- Modest increases in carbon taxes.</li> <li>- Relaxation of certain compliance mandates for cost-saving purposes.</li> </ul>	<ul style="list-style-type: none"> <li>- Delayed or flexible implementation of carbon taxes.</li> <li>- Initiatives promoting sustainable LNG production practices.</li> </ul>	<ul style="list-style-type: none"> <li>- Substantial hikes in carbon taxes.</li> <li>- Implementation of penalties for non-compliance with renewable energy transition goals</li> </ul>	<ul style="list-style-type: none"> <li>- Increased carbon taxes enforced.</li> <li>- Enhanced frequency of environmental audits with tougher penalties for non-compliance.</li> </ul>
LNG Demand	<ul style="list-style-type: none"> <li>- Demand growth decelerates in certain markets.</li> <li>- Key importers maintain stable LNG imports.</li> </ul>	<ul style="list-style-type: none"> <li>- Escalating spot prices in major markets.</li> <li>- Growing projections for long-term demand.</li> </ul>	<ul style="list-style-type: none"> <li>- Global LNG demand experiences a decline.</li> <li>- Major buyers cut contracts as they transition to renewable energy sources.</li> </ul>	<ul style="list-style-type: none"> <li>- Demand stabilizes at elevated levels.</li> <li>- Geopolitical factors sustain price pressure.</li> </ul>
Global Oversupply	Increasing global LNG stockpiles	Persistent supply shortages keep prices elevated.	Persistent oversupply leads to a decline in prices.	Supply aligns with demand, resulting in price stabilization.
Economic downturns	Slowing economic growth in key regions.	Strong global economic growth supports demand.	Global or regional recessions reduce overall energy consumption.	Regional economic slowdowns impact certain markets, while global demand stays strong.

## 4. CONCLUSION

The conclusions of this research are as follows:

1. There are several factors that contribute to the sustainability of the business. Some of the factors can be predicted. Scenario planning serves as a strategic tool to help a company navigate future uncertainties by identifying various possible scenarios and their impacts. This process enables organizations to understand risks and opportunities, develop flexible strategies, and enhance resilience to change. Additionally, scenario planning supports better decision-making, aligns long-term objectives, and ensures preparedness for diverse market or environmental conditions. As such, it is a crucial approach for crafting adaptive and proactive strategies for the future.
2. The scenario planning analysis has also enabled to answer:
  - a. The key driving forces that will impact the LNG industry business are shown in Table 4.1 below.

**Table 11. Identification of Key Driving Forces**

No	Category	Key Driving Forces
1	Political	Government Regulation
		Firmness in the regulation of fuel oil to gas conversion
2	Economic	Price – (Willingness to Pay)
		Big investment in LNG business
		Luxury Price of LNG
		Financing
3	Social	Local labor absorption
		CSR program
4	Technological	Small scale LNG
		CCS technology
5	Environmental	Green Energy and Low Emission
6	Legal	Legal Aspect with Lenders
		Long-term commitment from Domestic Buyer
		LNG Import Regulation
		International Carbon Trading

- b. The scenarios are derived from the combination of two critical factors, which are government regulation and price. The scenarios are as follows:
- 1) Stable but Limited Growth (Low Price & Supportive Government Regulation)
  - 2) Booming Market (High Price & Supportive Government Regulation)
  - 3) Challenging Market (Low Price & Restrictive Government Regulation)
  - 4) Profitable but Constrained (High Price & Restrictive Government Regulation)
- c. Early warning signals can serve as a leading indicator and a signpost for potential scenarios over the next five years. The early warning signals are:
- 1) Incentives for LNG industry
  - 2) Carbon taxation and compliance
  - 3) LNG Demand
  - 4) Global Oversupply
  - 5) Economic downturns

## 5. RECOMMENDATION

Herewith are some recommendations for PT BLNG to anticipate the uncertainties that might occur in the future:

1. Flexibility and Adaptability: PT BLNG must preserve operational flexibility to adapt to evolving regulatory environments and market dynamics. Actively monitoring early warning signals is essential for ensuring a prompt and effective response.
2. Efficiency and Cost Management: Across all scenarios, maintaining operational efficiency and optimizing costs are essential to achieving profitability and sustainability.
3. Diversification and Innovation: Investing in downstream LNG applications, renewable energy initiatives, and environmental technologies strengthens PT BLNG's long-term resilience amid the global energy transition.

4. Stakeholder Collaboration: Building strong partnerships with the government, industry peers, and international and domestic buyers is crucial for addressing regulatory challenges and capturing market opportunities.

## 6. IMPLEMENTATION PLAN

The implementation plan for each scenario within five years is concluded into a roadmap in Table 6.1 below:

**Table 12. Implementation Plan**

No	Strategy	Time Frame				
		Year 1	Year 2	Year 3	Year 4	Year 5
<b>A</b>	<b>Stable but Limited Growth</b>					
1	Enhance operational effectiveness. <ul style="list-style-type: none"> <li>- Conduct comprehensive cost audits to identify inefficiencies and areas for savings.</li> <li>- Deploy energy-efficient technologies to optimize gas liquefaction processes.</li> <li>- Implement AI-driven monitoring systems for equipment performance and predictive maintenance.</li> </ul>					
2	Strengthen domestic buyer relationships. <ul style="list-style-type: none"> <li>- Having close communications with PLN, PGN, and other industries.</li> </ul>					
3	Begin R&D for small-scale LNG applications. <ul style="list-style-type: none"> <li>- Conduct market research and feasibility studies for small-scale LNG applications in Indonesia</li> <li>- Identify low-cost technology solutions and initiate partnerships with local providers.</li> </ul>					
4	Use government subsidies to sustain operations. <ul style="list-style-type: none"> <li>- Allocate subsidy funds to reduce production costs by upgrading energy-efficient technologies, especially for liquefaction plant and optimizing processes.</li> <li>- Develop internal processes to track and meet subsidy compliance requirements (e.g., reporting, audits).</li> </ul>					
5	Pilot small-scale LNG solutions for transportation and industrial use. <ul style="list-style-type: none"> <li>- Collaborate with local businesses and transport operators, such as Pertamina , PGN, and PT NES to understand their energy needs and requirements.</li> <li>- Test LNG-powered vehicles in logistics and heavy transport fleets (e.g., ISO tank trucks, and shipping vessels).</li> </ul>					



No	Strategy	Time Frame				
		Year 1	Year 2	Year 3	Year 4	Year 5
	<ul style="list-style-type: none"> <li>- Collect user feedback on system reliability and ease of use during the pilot phase.</li> <li>- Ensure pilot phase meets all safety and environmental standards for LNG transportation and industrial applications.</li> </ul>					
6	<p>Evaluate capacity expansion.</p> <ul style="list-style-type: none"> <li>- Assess the current infrastructure's capacity to handle increased production, including storage, and export facilities.</li> <li>- Evaluate advanced technologies to improve efficiency and reduce the cost of capacity expansion.</li> </ul>					
7	<p>Expand modestly into downstream applications.</p> <ul style="list-style-type: none"> <li>- Roll out portable LNG filling station solutions for vehicles and industrial equipment.</li> <li>- Ensure compliance with domestic safety and environmental standards for downstream LNG applications.</li> <li>- Monitor pilot results and refine technologies based on user feedback.</li> </ul>					
8	<p>Align with government energy policies.</p> <ul style="list-style-type: none"> <li>- Regularly monitor government energy policies, including DMO, subsidies, and renewable energy targets.</li> <li>- Participate in industry forums and policy discussions to advocate for the role of LNG in meeting Indonesia's energy goals. For example, the Indonesian Gas Society (IGS) Forum</li> </ul>					
9	<p>Prepare for recovery by upgrading critical infrastructure.</p> <ul style="list-style-type: none"> <li>- Conduct a comprehensive audit of existing LNG facilities, including storage tanks, pipelines, and processing units.</li> <li>- Deploy digital monitoring and predictive maintenance tools to enhance reliability and performance.</li> <li>- Install emissions control systems to align with stricter environmental requirements.</li> </ul>					
<b>B Booming Market</b>						
1	<p>Expand production capacity.</p> <ul style="list-style-type: none"> <li>- Conduct detailed market studies to identify long-term LNG demand in domestic and international markets.</li> </ul>					

No	Strategy	Time Frame				
		Year 1	Year 2	Year 3	Year 4	Year 5
	<ul style="list-style-type: none"> <li>- Build additional LNG trains to increase liquefaction capacity.</li> <li>- Coordination with GOI to obtain more gas allocation from Upstream/Gas Seller.</li> </ul>					
2	<p>Allocate resources to scalable innovations.</p> <ul style="list-style-type: none"> <li>- Implement advanced AI and IoT-driven systems for real-time monitoring and process optimization in LNG production</li> <li>- Invest in CCS technologies to offset emissions from increased LNG production.</li> <li>- Collaborate with GOI/MEMR to align scalable innovations with national energy strategies.</li> </ul>					
3	<p>Invest in infrastructure and logistics.</p> <ul style="list-style-type: none"> <li>- Construct additional LNG trains to increase liquefaction capacity.</li> <li>- Invest in advanced jetty systems to accommodate larger vessels, for example, 180,000 cbm vessel size.</li> <li>- Incorporate heat recovery technologies to enhance energy utilization.</li> <li>- Upgrade safety systems in storage, transportation, and processing facilities to meet international standards.</li> </ul>					
4	<p>Explore emerging markets.</p> <ul style="list-style-type: none"> <li>- Build partnerships with local energy companies such as PGN, distributors, and government agencies in emerging markets.</li> <li>- Collaborate with infrastructure developers to expand LNG regasification and storage facilities.</li> <li>- Organize industry events and workshops in target regions to showcase PT BLNG's offerings and capabilities.</li> </ul>					
5	<p>Launch CSR programs.</p> <ul style="list-style-type: none"> <li>- Create a public health program to support community access to basic health services.</li> <li>- Create an economic empowerment program to achieve sustainable community development.</li> <li>- Create an education program through roaming library at the Community Centre to improve access and quality of basic education for local communities.</li> </ul>					

No	Strategy	Time Frame				
		Year 1	Year 2	Year 3	Year 4	Year 5
6	Develop carbon capture solutions to reduce emissions <ul style="list-style-type: none"> <li>- Partner with technology providers (such as NESR) and research institutions (such as LAPI ITB) to explore innovative carbon capture methods.</li> <li>- Conduct feasibility studies to determine optimal locations for CCS installations, focusing on proximity to LNG facilities.</li> <li>- Develop small-scale pilot carbon capture units at existing LNG processing facilities.</li> </ul>					
7	Achieve full production capacity. <ul style="list-style-type: none"> <li>- Upgrade and expand LNG trains to increase liquefaction capacity.</li> <li>- Train existing employees on advanced operational techniques and safety protocols to manage increased production.</li> <li>- Ensure all facility upgrades and production activities meet environmental and safety regulations.</li> <li>- Conduct regular audits and reviews to identify opportunities for further optimization.</li> </ul>					
<b>C Challenging Market</b>						
1	Focus on cost reduction. <ul style="list-style-type: none"> <li>- Conduct a comprehensive review of operational processes to identify inefficiencies and waste.</li> <li>- Negotiate long-term contracts with gas Sellers for better pricing</li> <li>- Optimize logistics and LNG vessel routes to minimize fuel and handling expenses.</li> <li>- Freeze or postpone non-essential capital expenditures.</li> </ul>					
2	Maintain core operations. <ul style="list-style-type: none"> <li>- Prioritize and concentrate on critical operations that have a direct impact on LNG production</li> <li>- Conduct necessary maintenance on vital infrastructure to avoid equipment malfunction</li> <li>- Reallocate workforce to focus on essential tasks and key operational areas.</li> </ul>					
3	Maintain lean operations. <ul style="list-style-type: none"> <li>- Conduct a comprehensive audit of all processes to identify inefficiencies and eliminate waste.</li> </ul>					

No	Strategy	Time Frame				
		Year 1	Year 2	Year 3	Year 4	Year 5
	<ul style="list-style-type: none"> <li>- Utilize smart systems to monitor and optimize energy consumption, identifying opportunities for reduction.</li> <li>- Promote a lean mindset among employees through regular training and workshops.</li> <li>- Reduce discretionary spending, such as non-essential travel, marketing, or administrative expenses.</li> </ul>					
4	<p>Implement predictive maintenance.</p> <ul style="list-style-type: none"> <li>- Install IoT sensors on critical machinery to collect real-time operational data (e.g., temperature, pressure).</li> <li>- Train maintenance staff to interpret predictive analytics data and act on insights effectively.</li> </ul>					
5	<p>Scale down operations.</p> <ul style="list-style-type: none"> <li>- Defer non-critical capital expenditures, such as infrastructure upgrades or expansions.</li> <li>- Communicate with regulators/MEMR about LNG production or facility activity adjustments.</li> <li>- Implement energy-efficient practices and technologies to further reduce costs.</li> </ul>					
6	<p>Seek government relief collaborations.</p> <ul style="list-style-type: none"> <li>- Collaborate on government-led initiatives to fund emissions reduction projects, such as Carbon Capture and Storage (CCS).</li> <li>- Negotiate temporary relaxation of regulatory requirements, such as environmental or safety compliance costs, during the downturn.</li> </ul>					
7	<p>Minimize non-essential operations.</p> <ul style="list-style-type: none"> <li>- Defer discretionary spending on non-critical items, such as travel, marketing, and external training.</li> <li>- Postpone upgrades or replacements of non-critical equipment.</li> <li>- Track cost savings and efficiency improvements resulting from minimizing non-essential operations.</li> </ul>					
8	<p>Maintain core LNG focus.</p> <ul style="list-style-type: none"> <li>- Focus on markets with steady or growing demand for LNG, such as domestic energy or industrial sectors.</li> <li>- Adjust pricing strategies to remain competitive in a low-demand or price-sensitive environment.</li> </ul>					

No	Strategy	Time Frame				
		Year 1	Year 2	Year 3	Year 4	Year 5
	- Evaluate operational success and prepare for scaling up as market conditions improve.					
<b>D</b>	<b>Profitable but Constrained</b>					
1	<p>Focus on domestic supply.</p> <ul style="list-style-type: none"> <li>- Having close communications with domestic Buyers, such as PLN, Pertamina PT NES, and other surrounding industries.</li> <li>- Negotiate long-term contracts with key domestic buyers, such as PLN, Pertamina, PT NES and other buyers.</li> <li>- Collaborate with GOI to understand and meet DMO requirements.</li> <li>- Develop competitive pricing strategies tailored to domestic buyers, for example, using the ICP pricing index instead of JCC or Brent pricing.</li> </ul>					
2	<p>Invest in emissions reduction technology.</p> <ul style="list-style-type: none"> <li>- Conduct a detailed audit of current operations to identify major sources of emissions.</li> <li>- Install pilot-scale CCS systems at LNG processing facilities to capture CO2 emissions during liquefaction.</li> <li>- Partner with technology providers such as PT NESR to deploy efficient CO2 compression and storage solutions.</li> <li>- Ensure all emissions reduction technologies comply with national and international environmental regulations.</li> </ul>					
3	<p>Negotiate high-value export contracts.</p> <ul style="list-style-type: none"> <li>- Mapping high-demand export markets with stable or growing LNG needs, such as Asia-Pacific</li> <li>- Prioritize high-value customers and focus on end-buyers, such as large-scale utilities and industrial consumers.</li> <li>- Develop flexible pricing models, such as oil-indexed, Henry Hub, or hybrid pricing mechanisms, to appeal to diverse buyers preferences.</li> </ul>					
4	<p>Reinvest profits into efficiency technologies.</p> <ul style="list-style-type: none"> <li>- Invest in advanced energy management systems to monitor and optimize energy use in real-time.</li> </ul>					

No	Strategy	Time Frame				
		Year 1	Year 2	Year 3	Year 4	Year 5
	<ul style="list-style-type: none"> <li>- Invest in water recycling systems to reduce water consumption in LNG cooling processes.</li> <li>- Implement predictive maintenance technologies to reduce unplanned downtime and optimize repair schedules.</li> </ul>					
5	<p>Build good relationships with buyers.</p> <ul style="list-style-type: none"> <li>- Establish regular communication channels, such as monthly calls, or meetings, to keep buyers informed about supply updates and market trends.</li> <li>- Offer training or educational programs on LNG handling and safety for buyer teams.</li> <li>- Use CRM (Customer Relationship Management) tools to track interactions, preferences, and performance metrics for each buyer.</li> <li>- Explore joint marketing initiatives to promote LNG usage in new sectors or regions.</li> </ul>					
6	<p>Invest in capacity upgrades.</p> <ul style="list-style-type: none"> <li>- Expand LNG storage facilities to accommodate increased production volumes.</li> <li>- Incorporate emissions reduction technologies, such as CCS, into upgraded facilities.</li> <li>- Use IoT-enabled sensors and predictive analytics to monitor upgraded systems and improve performance.</li> </ul>					
7	<p>Implement carbon neutrality measures.</p> <ul style="list-style-type: none"> <li>- Conduct a comprehensive greenhouse gas (GHG) emissions inventory for all operations.</li> <li>- Upgrade LNG processing systems with energy-efficient technologies, such as advanced compressors and heat exchangers.</li> <li>- Partner with verified carbon offset programs, such as reforestation, or community initiatives.</li> <li>- Work with GOI to align carbon neutrality measures with national and international environmental policies.</li> </ul>					

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