

Enhancing The Competitiveness of LNG Retail Business in East And Central Java (Case Study: PT Perusahaan Gas Negara Tbk.)

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Abstract - The role of natural gas is increasingly significant, especially in substituting the use of petroleum. Liquefying natural gas into LNG is a way to transport natural gas when transporting by pipeline is not feasible. LNG can be stored, shipped by sea transportation, and distributed using land transportation. The market of LNG sold in retail-based is very potential because of the encouragement from the Government to reduce LPG imports and optimize existing domestic LNG sources. To penetrate the potential market, a business strategy for PGN's LNG retail business in East and Central Java shall be defined. AFI strategy framework is used to effectively manage the business strategy formulation process. The business issue exploration resulted in the formulation of a complete set of strategy and business model canvas which will serve as a blueprint for a strategy to be implemented through organizational structures, processes, and systems. Findings and validations also resulted in several improvements in the midstream value chain that can increase the competitiveness of the LNG retail business.

Keywords - AFI framework, business strategy, competitiveness, LNG, retail

I. INTRODUCTION

Natural gas is considered as the fastest-growing fossil fuel, accounting today for 23% of global primary energy demand and nearly a quarter of electricity generation [1]. Natural gas is also often considered the form of energy that will be the "bridging fuel" to a sustainable energy system [2]. Particularly in Indonesia, the share of natural gas in the primary energy mix by 2025 is targeted at 22% and by 2050 is targeted at 24.0%, as stated in Government Regulation No.79 Year 2014 concerning National Energy Policy.

The role of natural gas is increasingly significant, especially in substituting the use of petroleum which reserves and production tend to decline. The national natural gas potential is much better considering that there are still many natural gas reserves that have not been exploited. In addition, gas is also a cleaner and environmentally friendly energy than petroleum [3].

The main challenge in the utilization of natural gas is the gas transportation system. Liquefying natural gas into LNG (Liquefied Natural Gas) is a way to transport natural gas when transporting by pipeline is not feasible. Natural gas is liquefied through an extreme cooling process to

minus 160 degrees Celsius, thus make it possible to transport gas in its liquid state with a volume of 600 times smaller than its volume in its gaseous state. LNG then shipped in special tankers to designated terminals.

PT Perusahaan Gas Negara Tbk (PGN) or Sub-holding Gas, subsidiary of PT Pertamina (Persero), is the leading natural gas distribution and transportation player in Indonesia. PGN and its subsidiaries continue to strengthen its position in the market by gradually transforming into an integrated energy solution company, encouraging the use of natural gas. To strengthen its core business and maintain energy fulfillment to customers due to lack of supply reliability from upstream gas suppliers in East Java, PGN develop East Java LNG Terminal in Terminal Teluk Lamong, a multipurpose terminal located in the border areas of Surabaya and Gresik, East Java.

The construction of an LNG receiving facility is one of PGN's strategic steps in creating a more flexible and sustainable supply source, developing LNG business, and achieving new business opportunities in East and Central Java. The LNG Terminal will be the first Mini Land-based LNG Terminal in Indonesia, which involves PT Pelabuhan Indonesia III (Persero) (Pelindo III) and its affiliates as owner of the lands and operator of Terminal Teluk Lamong, thus becoming part of synergy between PGN and Pelindo III.

The construction of the LNG Terminal has begun since August 2019 and is targeted for operation in early 2023. East Java LNG Terminal is mainly designed to function as a land-based LNG regasification facility with a capacity of 30 MMSCFD, which will distribute ex-LNG gas to PGN's East Java pipelines network and maintain gas supply reliability of East Java. To develop LNG business, an additional facility is built within the terminal, LNG Filling Station with capacity up to 21 BBTUD, which will serve potential customers that are located too far from the gas source and main pipeline. They will have access to natural gas by means of LNG filled in LNG Filling Station and transported by land using ISO Tank Truck.

The market of LNG sold in retail-based, or LNG retail, is very potential because of the encouragement from the Government to reduce the LPG imports and optimize existing domestic energy sources such as LNG. Until 2020, utilization of domestic LNG is only 6.69%, approximately

381.4 BBTUD from total gas supply 5,701.06 BBTUD (Fig. 1).

According to the Minister of Energy and Mineral Resources (MEMR), the natural gas policy in the future will focus on increasing the use of natural gas for the domestic market at competitive prices to create a multiplier effect, industrial competitiveness, and employment [3].

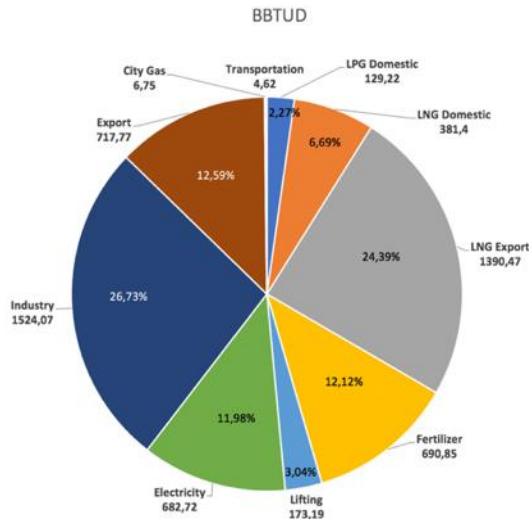


Fig. 1. Utilization of Indonesian Natural Gas [3]

In 2020, PGN has launched the Strategic Program of Sub-holding Gas, Seven National Gasification Program called SAPTA PGN [4]. This program is aimed at improving PGN's operations and an effort to be the national gas aggregator to fulfill the need for natural gas in an integrated manner. One of the programs is PGN for Retail and General Industries, which includes natural gas services through the provision of natural gas for the general industrial sector through pipelines and non-pipelines, as well as support for the development of Industrial Estates (KI) and Special Economic Zones (KEK) through transmission pipelines and distribution pipes. LNG retail is one of the priorities in PGN for Retail and General Industry program. With the East Java LNG Terminal being constructed in Teluk Lamong, East Java, PGN aims to penetrate markets in East Java that located too far from gas source or main pipeline. PGN also aims to penetrate the scattered markets in Central Java which is currently being served by limited CNG supply. The LNG retail business strategies will be crucial for PGN in achieving the program's target and in order to enhance PGN competitiveness in the LNG market.

The main objective of the research is to develop a business strategy for LNG Retail business in Central and East Java area by utilizing the East Java LNG Terminal, increase company commercial performance, and penetrate market that unreachable by gas pipeline. There are 3 research questions need to be answered :

1. What are the opportunities and challenges for PGN's LNG retail business?
2. What are business strategies that needs to be developed and implemented to penetrate the market in Central and East Java?
3. What are business process improvements required to make the LNG retail business sustainable and competitive to existing product of LPG and diesel?

II. METHODOLOGY

To develop a successful business strategy for LNG retail business in Central and East Java area, a set of actions must be taken by PGN to gain and sustain competitive advantage. Effectively managing the strategy process is the result of three broad tasks: Analyze (A), Formulate (F), and Implement (I) [5]. This research use AFI strategy framework to analyze, formulate, and implement a strategy that can result in superior performance of PGN's LNG retail business (Fig. 2).

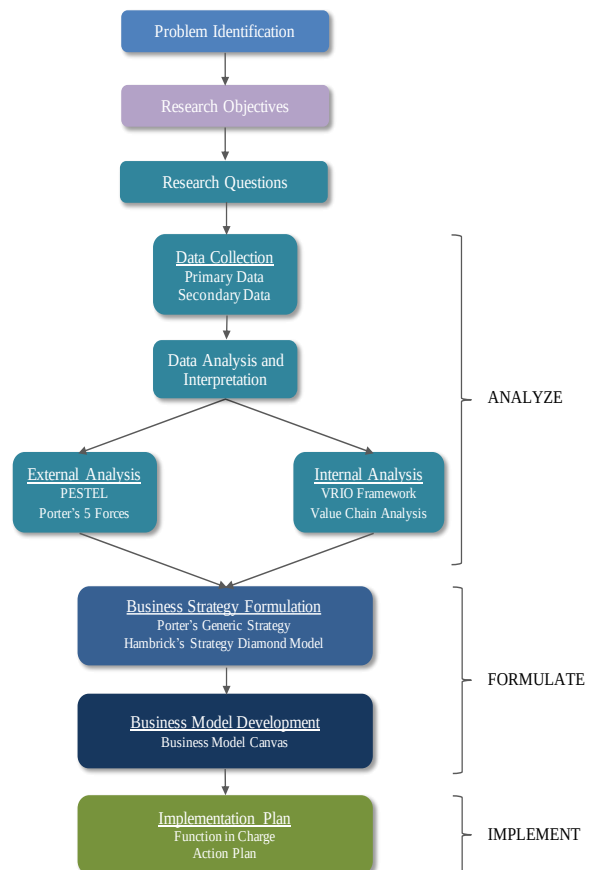


Fig. 2. Conceptual Framework

To answer the research questions, qualitative method is used to explore and understand the meaning individuals or groups ascribe to a problem. In a qualitative approach, the researcher seeks to establish the meaning of a phenomenon

from the views of participants [6]. The process of research involves emerging questions, data collections. The process of research involves emerging questions, data collections in the participant's setting, data analysis, and interpretation of the meaning of the data.

The data collected during the research are as follow:

1. Primary Data

Interview with the key personnel from several divisions in PGN that have good experience and knowledge related to supply, demand, and infrastructure of LNG. Respondents of qualitative research are limited to personnel from PGN that directly involved in the development of East Java LNG Terminal project.

2. Secondary Data

Secondary data are obtained or collected from existing resources, such as literature studies, company documentation, previous research, regulation, or scientific journals that are relevant to the problems.

A. External Analysis

To understand the effects of external environment on the firm's potential to gain and sustain a competitive advantage, external analysis was conducted. In this study, two approaches were used to analyze the firm's external environment, the industry in which the firm operates and the competitive forces that surround the firm from the outside. First, using PESTEL framework analysis, which allows us to scan, monitor, and evaluate changes and trends in the firm's macroenvironment [5]. Second, using Porter's Five Forces Model of competition, which helps us to determine an industry's profit potential [7].

B. Internal Analysis

A firm's ability to gain and sustain competitive advantage is partly driven by core competencies, that is a unique strength that is embedded deep within a firm. Looking inside the firm to analyze its resources, capabilities, and core competencies allows us to understand the firm's strengths and weaknesses. Whether they are strengths or weaknesses were determined by applying the VRIO framework to answers the question of what resources underpin competitive advantage [5].

Analysis of value chain is also needed to gain a deeper understanding of the internal activities a firm engages in when transforming inputs into outputs and understanding which of the firm's activities in the process of transforming inputs into outputs generate differentiation and which drive costs [5]. Through a careful analysis of the value chain, a more detailed and fine-grained understanding can be obtained of how the firm's economic value creation breaks

down into a distinct set of activities that help determine perceived value and the costs to create it.

C. Business Strategy Formulation

Based on the analysis of the external and internal environments, the next step in the AFI strategy framework is to formulate a business strategy that enhances the firm's chances of achieving a competitive advantage. Strategy formulation by defining business-level strategy using Porter's Generic Strategy and using Strategy Diamond Model to provides a concise way to show how the parts of an organization's strategy fit together.

Achieving competitive advantage requires firm to make a choice about the type of competitive advantage it seeks to attain and the scope within which it will attain it. According to Porter's theory, two basic types of competitive advantage combined with the scope of activities for which a firm seeks to achieve above-average performance led to three business-level generic strategies in an industry: cost leadership, differentiation, focus [8]. The focus strategy has two variants, cost focus and differentiation focus. The cost leadership and differentiation strategies seek competitive advantage in a broad range of industry segments, while focus strategies aim at cost advantage (cost focus) or differentiation (differentiation focus) in a narrow segment.

Diamond Strategy Model was developed by strategy researchers Donald Hambrick and James Fredrickson as a framework for checking and communicating a strategy [9]. A strategy has 5 elements, which provide answers to 5 questions:

1. Arena: Where will we be active?
2. Vehicle: How will we get there?
3. Differentiators: How will we win in the marketplace?
4. Staging: What will be our speed and sequences of moves?
5. Economic Logic: How will we obtain our returns?

Translation of strategy into action takes place in the firm's business model, which details the firm's competitive tactics and initiatives. A business model describes the rationale of how an organization creates, delivers, and captures value [10]. The firm's business model comprises nine building blocks that explain how the firm intends to make money and stipulates how the firm conducts its business with its buyers, suppliers, and partners. The nine blocks cover the four main areas of a business: customers, offers, infrastructure, and financial viability. The business model will serve as a blueprint for a strategy to be implemented through organizational structures, processes, and systems.

D. Strategy Implementation

Strategy implementation concerns the organization, coordination, and integration of how work gets done [5]. Effective strategy implementation is critical to gaining and sustaining a competitive advantage. The design of an organization, the matching of strategy and structure, and the implementation plan determine whether or not an organization that has chosen an effective strategy will be able to gain and sustain a competitive advantage.

III. RESULTS

Primary data collection through interviews was conducted based on 3 general perspectives in natural gas management: supply, demand, infrastructure, and additional perspective of organization considering that LNG retail business is carried out for the first time by PGN. The data collected are organized for further analysis by coding the data. It involves taking text data gathered during data collection, segmenting sentences (or paragraphs) into categories, and labeling those categories with a term, often a term based in the actual language of the participant [6].

The coding used to analyze the data is structured as follow :

X.Y.Z

- X : category of discussion; divided by current business condition (C) and potential improvement of business (I)
- Y : source of data; represents interviews from supply perspective (S), demand perspective (D); infrastructure perspective (I), and organization perspective (O)
- Z : sub-category of a more detailed category of discussion; symbolized in number

From the interview coding summary, the current business situations that were mostly discussed are selected as a major finding, which then mapped to the potential improvement of business. Each of the potential improvements is also validated for applicability using secondary data (see Table I).

TABLE I
MAJOR FINDINGS AND VALIDATION OF POTENTIAL IMPROVEMENTS

Major Findings	Potential Improvement	Validation Result
Fluctuated supply price according to the movement of crude oil price (C.S.7)	Request to Government for a fixed price of LNG (I.S.1)	<u>Not Applicable</u> The process of requesting a fixed price of LNG to government is considered very complex, especially it requires the approval of a reduction in government revenue in the upstream sector. It might also take a longer time to get the request approval, considering the implementation of gas price reduction took 4 years since the stipulation of Presidential Decree No. 40 of 2016.
Competitive price to end customer at least the same as CNG price (C.I.8)	Shared land transport cost by clustering customers and use milk-run scheme (I.I.2)	<u>Applicable</u> LNG is transported using ISO Tank and truck to end customer. By clustering and milk-run scheme, the trip route to several customers can be planned in a more efficient way using only 1 truck.
	Shared shipping cost by sharing utilization with other LNG projects (I.I.3)	<u>Applicable</u> In general, the contract of LNG Carrier (LNGC) is a Time Charter per year basis. Utilization of LNGC serving only East Java LNG Terminal demand is only 44% per year. Currently, PGN has several ongoing LNG projects. For example, LNG Project for implementation of MEMR Decree No. 13K/13/MEM/2020 regarding the implementation of supply and development of LNG infrastructure as well as conversion of BBM to LNG in the supply of electricity, also potential smelter and industry in Sulawesi. By using scheme of shared LNGC, PGN shall be able to optimize the current shipping cost and made the LNG retail price more competitive for end user.
	Synergy with Pertamina subsidiaries (Shipping Co.) for LNG shipping provision to get optimum shipping cost (I.I.4)	<u>Applicable</u> Currently, many shipping companies offering ships owned by other company, so the price is not competitive. PGN do not have resource and capability to own and operate LNGC. However, there is potential synergy with Pertamina Subsidiaries (Shipping Co.), where they can start investing on an LNGC vessel based on demand from PGN.
High cost for small volume (C.D.16)	Market expansion to hotel-restaurant-café (<i>horeca</i>) in Bali (I.D.1)	<u>Applicable</u> Market expansion to nearest area can be considered, such as Bali. By serving bigger LNG demand, the cost structure of East Java LNG Terminal can be further optimized. Study in 2018 shown a potential demand in hotel sector in Bali 1.7 BBTUD [11].

LNG for transportation (expedition truck and loading-unloading truck in port) (I.D.2)

Applicable

Market expansion to transportation sector is very potential. Moreover, PGN already has a Memorandum of Understanding (MoU) with Aprindo (*Asosiasi Pengusaha Truk Indonesia*) to use LNG as fuel for their logistics trucks [12]. In East Java only, there are 732,670 trucks [13]. 1% of trucks population, or 7,300 trucks, equal to LNG demand of 7.3 BBTUD, with assumption that each truck consumes 30 Litres of Diesel per day.

IV. DISCUSSION

A. Porter's Generic Strategies

Based on data analysis, data interpretation, external analysis, and internal analysis, PGN aim to serve a broad market, not only industry customer who use large amount of gas for their activity, but also *horeca* segment who use small amount of gas comparable to LPG. Considering the product to be sell is highly substituted by other energy for fuel and price is customer's priority, PGN need to choose a generic strategy of Cost Leadership (Fig. 3) and gain advantage from exploiting PGN capabilities to gain competitive cost from the LNG value chain managed by PGN. PGN can also increase market share by charging lower prices, while still making a reasonable profit on each sale because reduced costs. But it may depend on growth of the market.



Fig. 3. Porter's Cost Leadership Strategy for LNG Retail

B. Diamond Strategy Model

From generic strategy above, refining the elements of the strategy is needed to have a good strategy formulation or a complete strategy. A strategy is an integrated and

externally oriented concept of how a company will achieve its objectives and how it will compete against its rivals. Diamond Strategy model strategy consists of an integrated set of choices which related to five elements in order to arrive at specific answers to five questions. The Diamond Strategy Model (Fig. 4) is also linked to the result of applicable potential improvements from Table I.

1. Arenas: Where will we be active?

As the infrastructure of LNG receiving is being built in Teluk Lamong, East Java, the LNG retail product shall be focused to be marketed around the East Java LNG Terminal. Market in East and Central Java which located far from gas pipeline shall be PGN's main objective. PGN shall aim for industry customer who use large amount of gas for their activity and also *horeca* segment who use small amount of gas comparable to LPG.

2. Vehicle: How will we get there?

As a point of entry of LNG source, PGN build the first LNG receiving terminal in Java island located in Teluk Lamong, East Java. The East Java LNG Terminal build inside Pelindo III's affiliation terminal facility as a form of synergy between state-owned companies.

To deliver LNG to end customer, PGN will utilize subsidiaries PT Gagas Energi Indonesia (GEI) and PT Pertamina Niaga (PTGN). GEI and PTGN are mandated to focus on transportation business for non-pipeline gas, while PGN focus on the trading. They will invest on ISO Tank and regasification infrastructure, while the truck or logistic vehicle can be either self-investment or lease to other party. By organizing all supply chain within PGN group, PGN can ensure the safety and reliability of product to end customer.

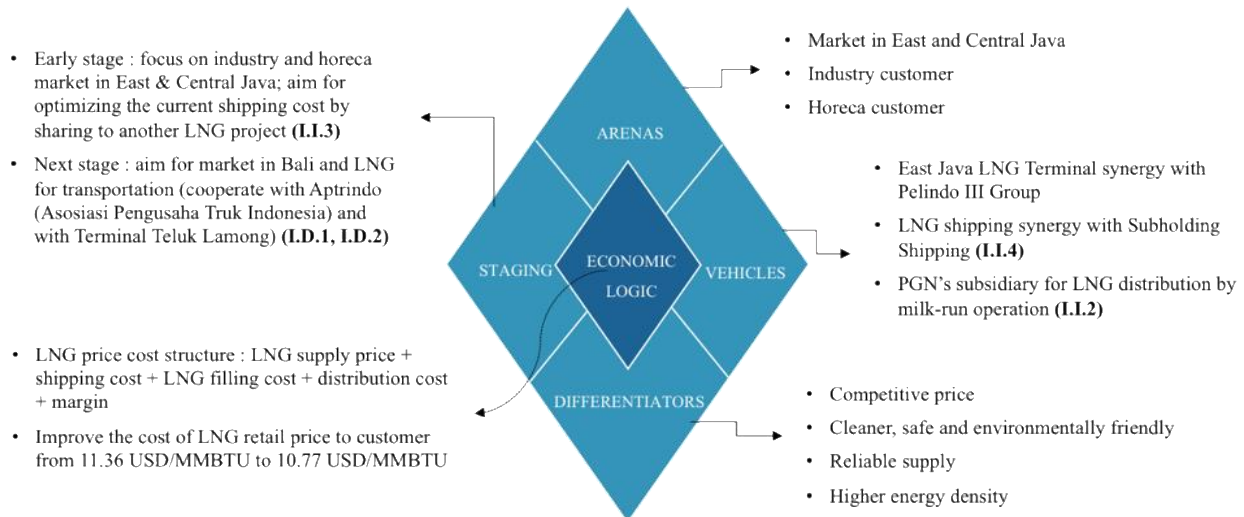


Fig. 4. Diamond Strategy Model for LNG Retail Business

Applicable Potential Improvements (I.I.2, I.I.4)

To deliver LNG from supply point to East Java LNG Terminal, PGN have an opportunity to enhance competitiveness by synergy within Pertamina Group, such as Shipping Co. who specialized in sea transportation vessel. LNG demand is scattered around Indonesia with a small volume in each location and characteristic of a shallow draught, so a small-scale LNG carrier is needed to serve those demand. As a demand aggregator, PGN can form a synergy of LNG carrier provision with Shipping Co. by delivering market to them. Due to ongoing study and cost calculation between PGN and Shipping Co., the potential synergy in provision of LNGC is recommended for further study.

Optimization of distribution cost can also be done by building a mini-LNG storage at several customer locations in a clustered route, so 1 ISO Tank truck can operate by milk-run scheme to serve several customers. Due to research limitation, mapping of customer clusters for milk-run scheme is recommended for further study with PGN's subsidiaries (GEI and PTGN).

3. Differentiator: How will we win in the marketplace?

As the characteristic of customer is very price centric, PGN shall focus on giving competitive price to customer, while promoting safe and environmentally friendly product. Reliability of supply LNG product shall also become strong selling point to customer, as risk of transportation is lower because lower trip frequency compared to CNG.

4. Staging: What will be our speed and sequence of moves?

In early stage PGN shall focus to grab the industry and *horeca* market in East and Central Java area as much as the LNG filling station capacity currently available (up to 21

BBTUD). Based on commercial data in 2020, there are 116 customers interested to use LNG retail with total volume 23.4 BBTUD (Fig. 5).

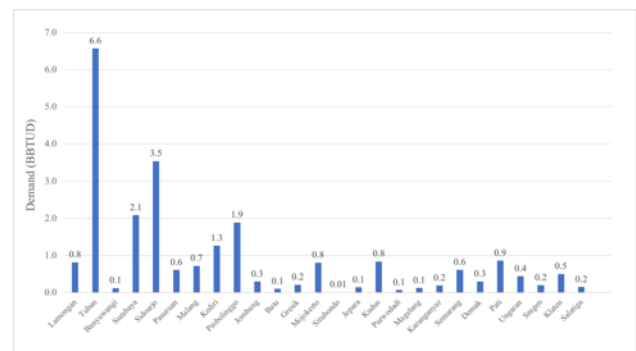


Fig. 5. Demand Canvassing of LNG Retail

Applicable Potential Improvements (I.I.3, I.D.1, I.D.2)

Based on current business situation, the shipping scheme is dedicated from LNG supply source directly to East Java LNG Terminal, with ship utilization only 44% per year. PGN shall optimize the shipping cost by sharing the time chartered LNGC to another LNG project. By using scheme of shared LNGC, PGN shall be able to optimize the current shipping cost and made the LNG retail price more competitive for end user.

At next stage, PGN shall also aim for market expansion to *horeca* sector market in Bali and LNG for transportation. PGN shall also follow up Memorandum of Understanding (MoU) with Aprindo to use LNG as fuel for their logistics trucks and cooperate with Terminal Teluk Lamong to use LNG for their loading-unloading logistic truck between the port to Madiun, Nganjuk, Caruban. Potential demand of market in Bali and LNG for transportation is approximately 1.7 BBTUD and 7.3 BBTUD.

5. Economic logic: How will we obtain our returns?

The cost structure of LNG retail price to end customer consist of LNG supply price + shipping cost + LNG filling cost + distribution cost + margin (Fig. 6).

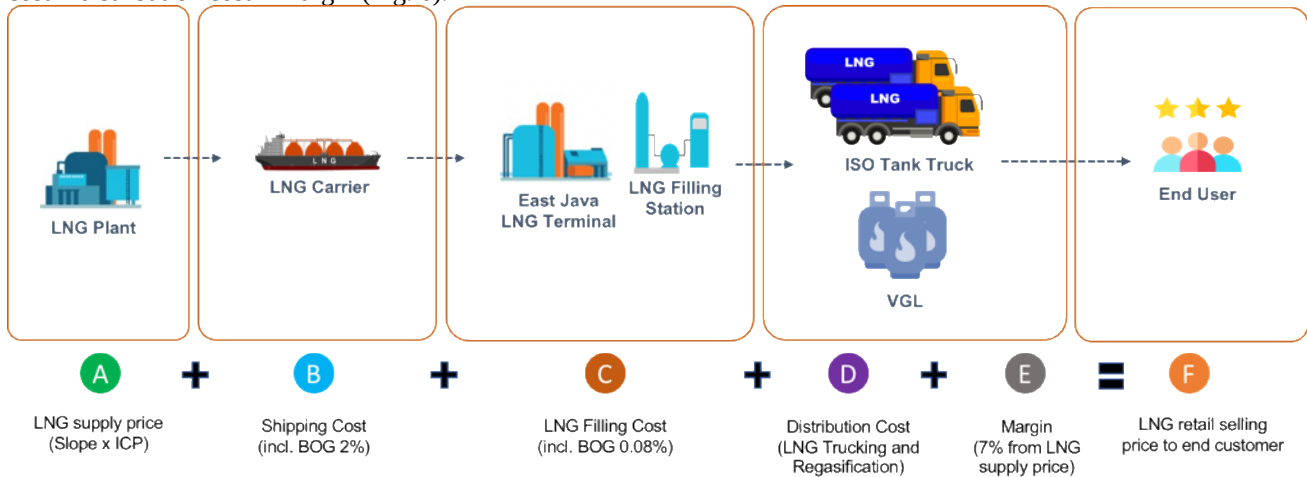


Fig. 6. LNG Retail Cost Structure

- A :** Indonesian LNG supply price is based on ICP or REP and may differ each month and year. ICP forecast in yearly basis from Facts Global Energy is used to simulate the LNG supply price in FOB basis from Bontang [14].
- B :** Shipping cost is calculated using the currently planned LNGC with size 30,000 m³, approximate rate of time charter USD 35,000/day, and 2% of BOG used as fuel for ship.
- C :** LNG filling cost is calculated by the given number of capital expenditure, several assumptions, IRR 11% based on MEMR Regulation No. 58 Year 2017 for pipeline infrastructure, PGN's income tax at 17%, and PGN's hurdle rate at 9.44%. The regasification cost is excluded from cost structure

because it's not directly involved in the LNG retail supply chain.

- D :** Distribution cost may vary according to customer location. The farther the location of the customer from the LNG terminal, the more expensive the cost will be. Cost of LNG trucking for distribution and regasification to end customers assumed to be an average of 2 USD/MMBTU.

- E :** Margin 7% from supply price is based on MEMR Regulation No. 58 Year 2017 for pipeline infrastructure.

The applicable potential improvements (I.I.3, I.D.1, I.D.2) is also calculated to see the economic logic on the cost leadership strategy. The scenarios simulation described in Table II and the economic result is shown in Fig. 7.

TABLE II
SCENARIOS SIMULATION

Scenario	Applicable Potential Improvements	Cost Structure Improvement
Optimize A	Shared shipping cost by sharing utilization with other LNG projects (I.I.3)	B = shipping cost is calculated by sharing the utilization to LNG project in Sulawesi (smelter with assumed demand 8 BBTUD and industry with assumed demand 3 BBTUD)
Optimize B	- Market expansion to <i>horeca</i> in Bali (I.D.1) - LNG for transportation (expedition truck and loading-unloading truck in port) (I.D.2)	C = LNG filling cost is re-calculated from 2025 onward by adding demand from <i>horeca</i> in Bali and LNG for transportation. Additional 1 filling station is constructed in 2024.
Optimize C	- Shared shipping cost by sharing utilization with other LNG projects (I.I.3) - Market expansion to <i>horeca</i> in Bali (I.D.1) - LNG for transportation (expedition truck and loading-unloading truck in port) (I.D.2)	B = shipping cost is calculated by sharing the utilization to LNG project in Sulawesi (due to utilization shall not be more than 80%, LNGC shared only to smelter with assumed demand 8 BBTUD) C = LNG filling cost is re-calculated from 2025 onward by adding demand from <i>horeca</i> in Bali and LNG for transportation. Additional 1 filling bay in the filling station is constructed in 2024.

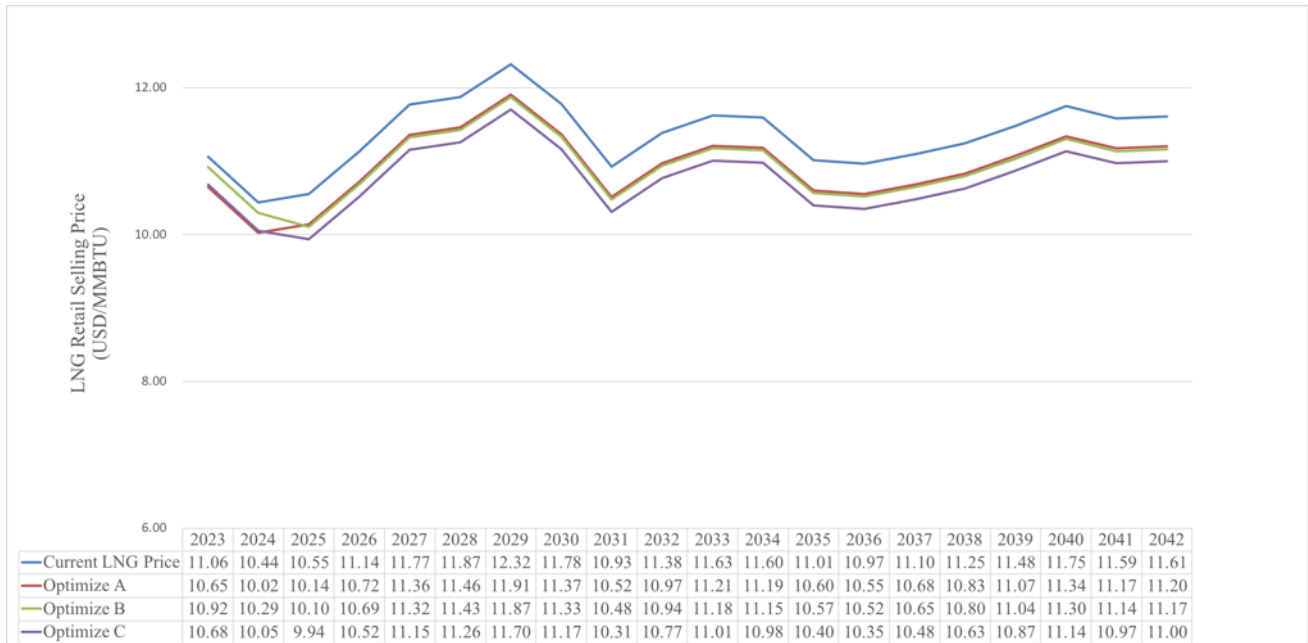


Fig. 7. Economic Simulation Result

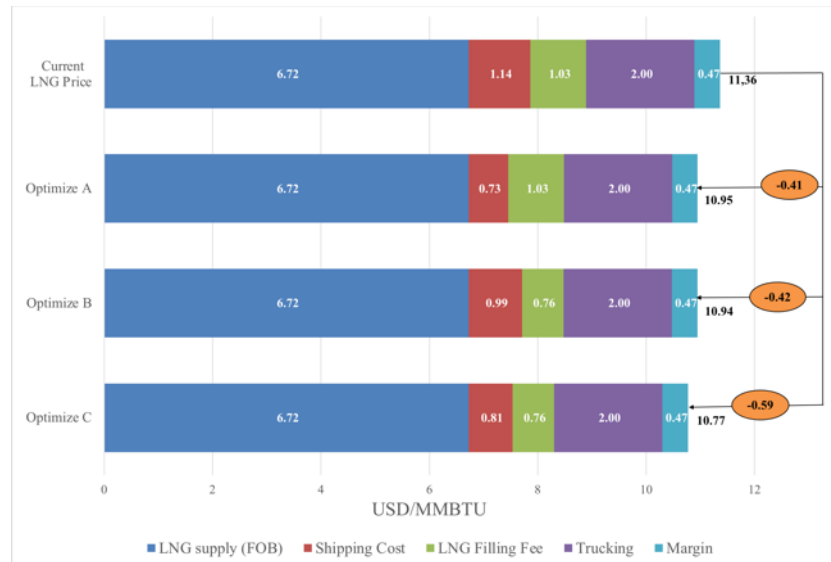


Fig. 8. Comparison of Average LNG Price

Comparison of average current LNG price and average LNG price from 3 optimize scenarios based on the applicable potential improvement is shown in Fig. 8. Overall, scenario of Optimize C gives the best result and able to improve the cost of LNG retail price to customer from 11.36 USD/MMBTU to 10.77 USD/MMBTU.

The shipping cost and LNG filling cost are also compared to similar projects in Indonesia with results shown in Table III.

TABLE III
COST COMPARISON TO SIMILAR PROJECTS

Shipping Cost	Price (USD/MMBTU)	Remarks
Tangguh to Java 1	0,70	LNGC 125,000 m3 (std.cargo)
Tangguh to Sumatera	0,75	LNGC 125,000 m3 (std.cargo)
Bontang to Benoa	1,40	LNGC 22,500 m3 (small scale)
Current Condition (LNG Shipping from Bontang to East Java)	1,14	LNGC 30,000 m3 (small scale)

Optimize A (Sharing LNGC from Bontang to East Java, smelter and industry in Sulawesi)	0,73	LNGC 30,000 m3 (small scale)
Optimize C (Sharing LNGC from Bontang to East Java and smelter in Sulawesi)	0,81	LNGC 30,000 m3 (small scale)
LNG Filling Fee	Price (USD/MMBTU)	Remarks
Filling Station Arun	1,10	1 Station @40 m3/hr
Filling Station Bontang	0,82	6 Stations @20 m3/hr
Current Condition (Filling Station East Java LNG Terminal)	1,03	3 Stations @40 m3/hr
Optimize B (Filling Station East Java LNG Terminal)	0,76	4 Stations @40 m3/hr

Current scheme of dedicated LNGC serving East Java LNG Terminal is more competitive than shipping cost from Bontang LNG Plant to Benoa (FSRU Karunia Dewata) which almost similar in capacity of a small-scale vessel. Optimize A and C scenarios able to improve further the shipping cost, almost similar to the cost of standard cargo shipping using large vessel.

Current condition of LNG filling cost in East Java LNG Terminal is not competitive compared to LNG Filling Station in Bontang which similar in capacity. Optimize scenario B able to reduce the filling cost in East Java LNG Terminal and become the most competitive compared to other LNG filling facilities.

C. Business Model Canvas

Based on generic strategy and diamond strategy described above, action shall be organized in a form of business model. The business model will serve as a blueprint for a strategy to be implemented through organizational structures, processes, and systems (Fig. 9).

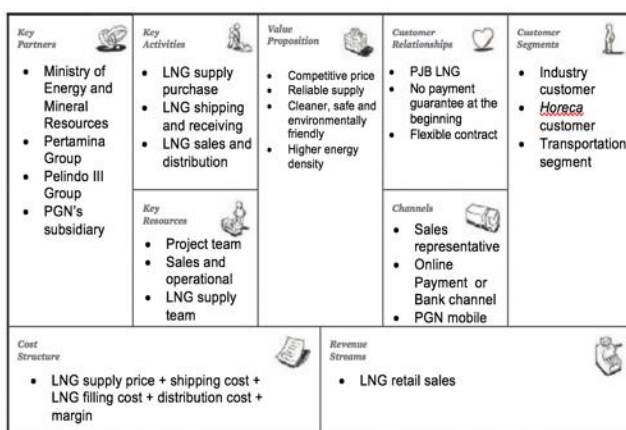


Fig. 9. LNG Retail Business Model Canvas

V. CONCLUSION

Based on the result of the research, the research questions can be answered. First, LNG retail business in East and Central Java are very potential and can encourage more utilization of LNG in domestic as envisioned by Government. Currently, there are potential market up to 23.4 BBTUD in current target area of East and Central Java. There is also potential LNG business expansion to other area, such as Bali for *horeca* sector, and also LNG for transportation. Opportunity of cooperation with Aprindo to use LNG as fuel for their logistics trucks and cooperate with Terminal Teluk Lamong to use LNG for their loading-unloading logistic truck between port to Madiun, Nganjuk, Caruban. The main challenge of LNG retail business is the fluctuated price of LNG supply as current pricing is linked to crude oil price and obtaining competitive LNG price to end customer.

The answer to the business strategy needed for PGN is by aiming to serve a broad market, not only industry customers who use large amount of gas for their activity, but also *horeca* segment who use a small amount of gas comparable to LPG. Considering the product to be sell is highly substituted by other energy for fuel and price is customer's priority, PGN need to choose a Cost Leadership strategy and gain advantage from exploiting PGN capabilities to gain competitive cost from the LNG value chain managed by PGN.

Applicable potential improvements to enhance the competitiveness of LNG Retail business in East and Central Java are a combination of the following scenarios:

1. Optimize LNG shipping cost by sharing utilization the time chartered LNGC with other LNG projects
2. Optimize filling cost by increasing demand, such as market expansion to *horeca* sector in Bali
3. Optimize filling cost by increasing demand, such as market expansion to LNG for transportation sector (expedition truck and loading-unloading truck in port)

Those improvement combinations are able to improve the cost of shipping from 1.14 USD/MMBTU to 0.81 USD/MMBTU and LNG filling cost from 1.03 USD/MMBTU to 0.76 USD/MMBTU. Compared to similar LNG projects in Indonesia, the shipping cost and LNG filling cost are able to become the most competitive compared to other projects that similar in capacity. The overall LNG retail price to end customers is reduced from 11.36 USD/MMBTU to 10.77 USD/MMBTU.

Further study is recommended regarding the potential improvement of shipping cost through synergy with Pertamina Group, such as Shipping Co. who specialized in sea transportation vessels. Potential improvement in

distribution cost (ISO Tank trucking and regasification) is also recommended for further study with PGN's subsidiaries (GEI and PTGN) through mapping of customer clusters for milk-run scheme distribution.

The implementation plan is divided into 3 parts, which are period before commercial and operation, period of early-stage commercial and operation, and period of next stage commercial and operation.

Period before commercial and operation of East Java LNG Terminal shall focus on customer acquisition, optimization of LNG shipping strategy to make cost structure more competitive, and also synergy with key partners. At the early stage of commercial and operation, PGN shall focus on sales and distribution management. PGN shall also start exploring more market potential as planned in the business strategy. At last stage, after acquiring and confirming the market, PGN shall start expansion by built the required infrastructure's upgrade. After the infrastructure is ready, PGN shall start the sales and distribution management.

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