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NATURAL GAS SALES OPTIMIZATION STRATEGY OF PT XYZ IN EAST JAVA

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Abstract: The condition of supply and demand for natural gas in East Java will experience dynamics, based on government work plans for Java gas pipeline, Tuban refinery and new gas field development. This research aims to analysis and simulate the gas market from 2021 to 2035 and develop gas marketing strategy to optimize PT XYZ's revenue. The Dynamic Model System method is used in scenario and market analysis, the AHP method is used for segmentation, targeting and positioning, while the Focus Group Discussion is used for the implementation strategy of optimizing revenue from gas sales. The results of the study show that during the period 2022 – 2025, the gas market in East Java experienced an excess of gas supply by 249 mmscfd, the second period in 2026-2030 the gas market was still a surplus of 53 mmscfd, but in 2030-2035 the gas market experienced a shortage of 260 mmscfd. PT XYZ's strategy is to prioritize the fertilizer sector, PGN industry and electricity through gas traders as the main buyers by using the main criteria for volume, utilization period and gas price as a reference in preparing scenarios and implementation strategies. The scenario is optimistic that the improve in gas production and maximize gas marketing will increase PT XYZ's revenue and position as the market leader in East Java.

Keywords: AHP, gas marketing, natural gas, optimization, system dynamic model

Abstrak: *Kondisi pasokan dan permintaan gas bumi di Jawa Timur akan mengalami dinamika didasarkan kepada rencana strategis pemerintah terkait pipanisasi gas, pembangunan kilang Tuban dan pengembangan lapangan gas baru. Penelitian ini bertujuan untuk menganalisis pasar gas tahun 2021 - 2035 dan mengembangkan strategi penjualan gas untuk mengoptimalkan penjualan gas PT XYZ. Riset dan skenario pasar gas menggunakan System Dynamic Modeling (SDM). Strategi penjualan gas berupa segmentasi, targetting dan positioning menggunakan metode Analytical Hierarchy Process (AHP) serta Focuss Group Discussion untuk strategi implementasi upaya optimalisasi pendapatan dari penjualan gas. Hasil menunjukkan bahwa selama periode 2022 – 2025, pasar gas di Jawa Timur mengalami kelebihan pasokan gas sebesar 249 mmscfd, periode kedua pada tahun 2026-2030 pasar gas masih surplus 53 mmscfd, namun pada tahun 2030-2035 pasar gas shortage sebesar 260 mmscfd. Strategi PT XYZ mengutamakan sektor pupuk, industri PGN dan kelistrikan melalui gas trader dengan kriteria utama jumlah volume, jangka waktu pemanfaatan dan harga gas sebagai referensi dalam penyusunan skenario dan strategi. Skenario optimis dengan peningkatan produksi dan penjualan gas akan meningkatkan revenue dan posisi PT XYZ sebagai market leader di Jawa Timur.*

Kata kunci: *AHP, pemasaran gas, gas bumi, optimalisasi, model dinamis sistem*

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INTRODUCTION

Natural gas is a hydrocarbon energy that is widely used in the country after oil and coal. Natural gas has an important role in Indonesia's energy mix policy. The largest allocation for the use of domestic natural gas is for the industrial sector, followed by electricity and fertilizer. The total allocation for above sectors reached 94.37% in 2019 (Satuan Kerja Khusus Migas, 2019). Domestic gas demand in Indonesia is currently divided into several regional areas and will be interconnection through pipeline from Sumatra, Java and Kalimantan. East Java gas pipeline will be connected to Central Java and West Java in 2021 onward (Kementerian Energi Sumber Daya Mineral, 2021). Java island has high population density, industrial growth and high energy consumption (Badan Pusat Statisik, 2022).

The East Java region currently has a natural gas consumption rate of 598 mmscfd and a gas supply of 542 mmscfd at the end of 2021 (SKK Migas, 2021). Natural gas supply and demand in East Java is dynamic, several government policy plans related to the development of the Gresem gas pipeline from East Java to Central Java in 2021, gas pipeline from Semarang to Cirebon in 2025, construction of the Tuban Grass Root Refinery (GRR) refinery in 2025, development of LNG re-gasification facilities in Gresik - East Java (Kementerian Energi Sumber Daya Mineral, 2021). East Java's gas supply is expected to increase because there are three upstream projects that will operate in 2019 i.e Husky CNOOC, Jambaran Tiung Biru (JTB) and PEP Lengo Field in 2020 (Kementerian Energi Sumber Daya Mineral, 2018), however until the end of 2021 it turns out that the project has been delayed one of the reason due to Covid-19 pandemic (Satuan Kerja Khusus Migas Migas, 2021). Following in economic conditions, government policies is significantly affect to the gas production and demand in East Java especially for gas bussiness players sustainability plan. In East Java gas market, several players are involved along the value chain, i.e. from exploration, production, trading, to transmission and distribution. The dynamics of the variables of exploration, production and consumption, are sensitive to initial demand conditions (Chi et al. 2009). The fertilizer, Perusahaan Gas Negara (PGN) Industry, government power plant still dominated as gas buyer in East Java. The gas trades in the Indonesia gas market are dominated by bilateral long-term contracts. For the gas traded via pipelines, based on an interview conducted with the upstream regulator, the price is flat with an escalation of 3 to 4% for each three years. The price of gas for industry is set by the government at 6 US$/mmbtu, but government deducts income tax from gas Production Sharing Contract (PSC) company as a gas producers to stimulate investment (Satuan Kerja Khusus Migas, 2019).

The Figure 1 shows that the condition of gas supply is influenced by the current condition of infrastructure and gas production. Demand conditions are influenced by the development of various industries that use gas as a raw material or energy source. These two things are closely related to government policies in terms of energy.

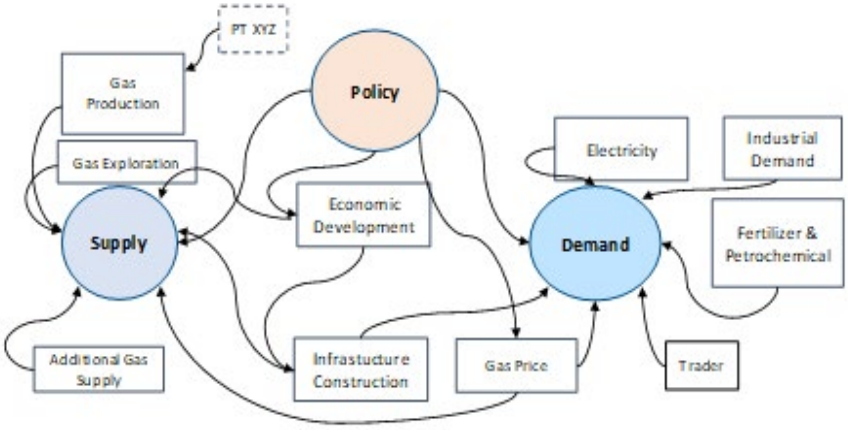

Figure 1. Structure of gas supply and demand in East Java Indonesia

PT XYZ is one of the upstream oil and gas business players operating since 2016 in the East Java. This company supplied 86.88 mmscfd of natural gas in 2020 or 84% of the annual target (Figure 2). They have a plan to develop gas production from new fields according to Plan of Development (POD), but on the other hand the distribution of gas from existing fields is still not optimal due to production problems and especially gas sales consumption.

The current supply and demand condition is inadequate. There will be deficit of supply every year except for 2023. The maximum daily deficit is 230.1 mmscfd in the year 2022 (Kusuma et al, 2020). In 2019 - 2022 the gas supply will oversupply in East Java. This research has not undergone any updates regarding the infrastructure for the construction of refineries and pipelines as well as the condition of the delay in gas supply which has an impact on the condition of the gas market in East Java. The government policies especially economic development and infrastructure is more significant effect to the gas energy market (Aron, et al. 2021), this research adds a reference in analyzing the gas market in a more comprehensive point of view.

The structure of the supply and demand conditions for natural gas in East Java described as figure 1. The current PT XYZ gas buyer's are PGN industry, fertilizer and gas traders their taken gas from field A. PT XYZ's have plan to produce gas from new fields B and C faces the challenge of maximizing gas sales The future market of natural gas for industry will become dynamic along with infrastructure development and gas price policy for industry and plant gate. The system dynamics (SD) model to simulate gas market behaviors and estimated China's gas storage capabilities and import demands over the next 40 years (Chen et.al 2021).

Research the market can help companies in identify opportunities in the market. Market research too useful for determining what strategy is right used so as to minimize the risk that might happen (Siregar et al. 2017). Gas market penetration by carrying out a series of marketing strategies in the form of segmentation, targeting, positioning and implementation is a fairly comprehensive strategy. Hypotheses supported by complete and accurate data scientific will facilitate the preparation of gas sales optimizing strategies.

The purpose of this study are to mapping, analysis of gas supply- demand and simulate models, create scenarios and predictions of gas supply and demand conditions in East Java until the period of 2035. The gas balance until 2035 will be used as a reference to optimizing production and sales. The output of this model can be as a reference for strategy optimizing business strategy related to the sustainability oil and gas business in Indonesia, especially in East Java. The academics can use this research as knowledge or reference for further gas business and management research. The current condition in East Java have been change due to gas supply decline earlier from gas supplier, delayed of gas project plan due to Covid-19, gas pipeline infrastructure and government project has been delayed so the prediction and marketing strategy need to be update.

METHODS

The research was conducted in East Java and PT XYZ offices in Surabaya and Jakarta. The time needed to conduct this research is from September 2021 to March 2022. Primary data were obtained from field observations, discussion forums with business people in East Java, interviews and filling out questionnaires with experts. Secondary data was obtained from the literature and some supporting data from related agencies such as Satuan Kerja Khusus Migas under Kementerian ESDM, Gas Coordination Meeting Result that frequently monthly updated. To analyze the market for natural gas supply and demand in East Java and the causal factors that influence it by using a system dynamic (SD) model, This method is widely used in market and policy analysis, suitable with gas production type that's natural gas reservoir conditions and is easy to use compare with Monte Carlo or traditional time series forecasting. Furthermore, simulations, scenarios and projections of supply and demand conditions for natural gas are carried out for the period 2021–2035 using dynamic and excell system models. SD methodology has been used to explore the supply demand of energy sources. The future gas market is required to be analysis, first hypothesis is surplus in first period 2021 onward due to new gas field producing after Covid-19 Pandemic is over, however in 2030 onward is potential gas shortage due to gas decline , those are conditions were influenced by the uncertainty of the natural gas market in East Java. Second hypothesis for gas buyer market, that's still domination form electrical and retail industry but not limited for fertilizer and petrochemical sector especially in East Java region.

Figure 2. PT XYZ gas production

The research studies on this topic a with the natural gas supply and demand in East Java to enable sustainability scenario by using this approach. The strategy for selecting gas buyers is carried out using the AHP method by interview three of expert from marketing, calculating consistency test with output expectation have good gas buyer alternatives. Next step is to combined boths are method with a scenario plan for marketing strategy to optimizing sales gas of PT XYZ in East Java province. Data collection and literature reference used from Energy Ministry, journal, monthly gas reports to formulating, verification and validation using SD Vensim software. The concept of this research has described in the following Figure 3. Some of the data source variables used in this study were obtained from various sources for developing system dynamic model as described in the following Table 1.

RESULTS

Mapping and Modelling Gas Market in East Java

Based on infrastructure, policy and economic development in East Java, the patterns supply and demand gas can be modelling as cause and effect. The data in the model come from the Indonesia Ministry of Energy and Mineral Resources, SKK Migas 2020, Minute of Meeting Gas Coordination Meeting (GCM) East Java. Modeling gas supply and demand in East Java using Vensim PLE software with the results depicted in a causality model as in Figure 4.

Table 1. Variable and data sources

Variables	Description	Source
Gas Supply		
Additional gas supply from LNG	Potential supply of LNG gas from Gresik Regasification, when the new gas project is delayed	SKKMigas and Forum Group Discussion (2021)
New potential Gas Supply	New Gas Potential based on POD (Plan of Development)	SKKMigas and Forum Group Discussion (2021)
Gas Supply Existing	Existing gas supply based on POD using WP&B and GCM data 2021	SKKMigas and Forum Group Discussion (2021)
Gas Supply of PT XYZ	PT XYZ gas supply based on Plan of Development (POD)	PT XYZ POD
Gas Demand		
GRR Tuban Project	Grass Root Refinery Project in Tuban, East Java 2025	ESDM 2018
CNG Industry Scheme	Gas Processed Industry Needs to be Compressed Natural Gas (CNG) in East Java	ESDM 2018
Gas Trader Demand	Natural Gas Trading needs in East Java	ESDM 2018 and Forum Group Discussion (2021)
PGN Industry	Total Industrial Needs under the control of PGN as a supplier and distributor of gas	ESDM 2018 and Forum Group Discussion (2021)
Total Demand Electricity	PLN's Total Gas Needs based on the 2021-2030 Electricity Supply Business Plan (PLN Grati, Tambak Lorok, IPP)	ESDM 2018 & RUPTL 2021
Fertilizer and Petrochemical	Gas Demand by Fertilizer-Petrochemical Industry, Petrokimia Gresik (PKG) company	ESDM 2018 and Forum Group Discussion (2021)
Central Java Industry	Gas demand by industry in Central Java, based on data from the PGN Commerce Business Entity after the Gresik-Semarang gas pipeline was connected	ESDM 2018
West Java Industry	Potential demand and supply of pipeline gas in West Java after the connection of the Semarang-Cirebon gas pipeline	ESDM 2018

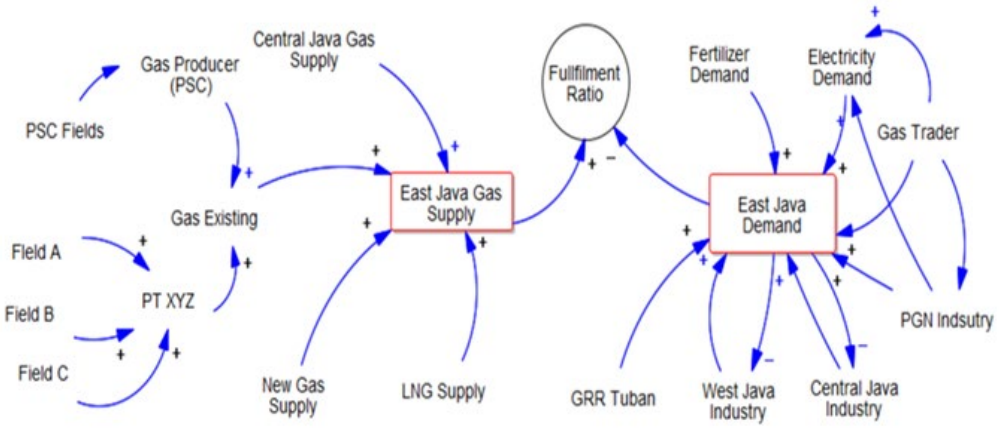

Figure 4. Causality model

Factors that affect gas supply include, the existing piped gas supply, which has been produced by the Production Sharing Contractors (PSC) in the East Java area until 2021. Pipeline gas supply from Central Java, potential gas supply pipelines from West Java and the potential for new gas discoveries in the East Java and Central Java areas. The demand variable is marked with a positive sign (+) which means an increase in demand, while a negative sign (-) reduces demand. Gas demand from Central Java and West Java has the potential to increase or decrease gas demand in East Java. The gas demand factor in East Java is influenced by gas demand for electricity, fertilizer, PGN industry, gas trader, GRR Tuban, Java industries.

Gas supply existing consist of suppliers Kangean Energi of 150 mmscfd, PHE WMO of 57 mmscfd, Medco of 78 mmscfd, Petronas 48 mmscfd, Saka Energi of 28, PEP Poleng of 5 mmscfd, Minarak Brantas 23 mmscfd, PEP Sukowati 4 mmscfd, Field Cepu 2 mmscfd. PT XYZ's gas supply consists of field A of 100 mmscfd, field B of 150 mmscfd and field C of 50 mmscfd. The current supply from Central Java from PEP Gundih is 45 mmscfd, Saka Muriah is 24 mmscfd, PHE Randugunting is 3 mmscfd and PEP ADK is 3 mmscfd. Bussines as Policies (BAP) that will potential for new gas is supplied from the JTB field, Medco, Petronas, Minarak Brantas, PEP Cepu fields with a total production potential estimated to reach from 50 mmscfd to 800 mmscfd peak in 2030. Other supplies are obtained from LNG gasification in the Gresik area which is estimated to supply 57 – 240 mmscfd.

Gas demand in the electricity sector or gas power plants. The electricity sector in East Java currently has the PLN Gresik Pembangkit Jawa Bali (PJB) power plant with a total installed capacity of 2222 MW consisting of 4 (four) PLTU units. Currently, each unit of UP Gresik has used natural gas as fuel. The existing natural gas demand for UP Gresik is BBtud (PLN 2015). According to the government's plan with a 35,000 MW program, PLN through PJB will add a power plant in Gresik, namely PLTGU Jawa 3 with a capacity of 600 MW, which means it requires a natural gas supply of 52 BBtud or equivalent to 51 mmscfd. Gas demand PGN's industrial sector are very diverse, business-wise, PGN acts as a natural gas transporter to consumers in various industries, commercial, transportation, retail, household with thousands of customers in East Java. Currently PGN gas demand in 154 mmscfd from many gas supplier. Fertilizer sector have demand in 144 msscfd majoring from Petrokimia Gresik as a main player in East Java an the potential competitor is GRR Tuban that have plan onstream on 2025 with capacity consumption 320 mmscfd. Gas trader is part of gas consumer who have competitve in the gas market. Data in 2021 there are 6 (six) gas traders who absorb gas in the East Java area, one of which has a contract with PT XYZ for 35 mmscfd, the trader have acces to various consumer including PLN and other State Entreprises. The Java gas pipeline will triger gas demand in between three provindes in Java vice versa, the demand approximitely in 300-400 mmscfd based on SKK Migas report.

The map descripted of gas suppliers and buyers in East Java along with pipeline infrastructure, industry and total gas volume. Existing gas supply in East Java which consists of 11 gas suppliers (Kangean Energi Indonesia, PHE WMO, Petronas, Medco Energi, Minarak Berantas, PEP Asset 4 Poleng, Saka Indonesia Pangkah Ltd, PHE TEJ, PEP Sukowati) and PT XYZ. The Central Java pipeline gas supply consists of 4 gas suppliers in the Central Java area (PEP Dield Gundih, Saka Muriah, PHE

Randugunting and PEPC ADK). The Gresik – Semarang gas pipeline has been connected since mid-2021 so that it can supply and utilize gas pipelines in both areas. The potential new gas suppliers consist of several gas wells and gas companies in East Java. West Java gas supply and demand are still waiting for the completion of the Semarang - Cirebon gas pipeline project which is still under construction. From the buyer side of gas pipelines, PKG petrochemical fertilizer industry, PGN industry, PLN Gresik, Grati – IPP power plant, LPG/CNG gas processing industry and gas traders. The Tuban GRR project plan and the East Java-Central Java gas pipeline will also increase gas demand in the Java area.

Model Analysis and Scenario Building

The model development of the gas market based on causality models, maps, supporting data by formulating refere data source as per the Table 1, verification supply and demand gas from 2021 – 2035. This model development system uses Vensim PLE software, simulating and verifying the system without any errors by running the software. The formulation is made from supplier gas production data and gas demand rates sourced from the Ministry of Energy and Mineral Resources, SKKMigas and results from group discussion forums, so as to describe the conditions and flow in the model. Validation is carried out by checking the model against mathematical equations that have been made by simulation using the Mean Absolute Percentage Error (MAPE) test method, the accuracy error of gas supply and demand in the 2018 - 2020 period is 2.7 % and 0.81 %. it can be seen that the programs and models conceptualized in the flow chart have been running well and correctly if the error is < 5%. When the formulation and validation have been completed, then scenario is made for the period from 2021 to 2035. The supply scenario is based on two scenarios of supplying existing gas and assumption potential new gas. Demand scenario, scenario 1 with existing demand conditions without the Tuban GRR and the West Java gas pipeline operating, scenario 2 West Java gas pipeline operating and scenario 3 West Java gas pipeline and Tuban GRR operating. During the period 2021 – 2025, gas supply will experience a surplus, in 2026 – 2035 it will begin to decline until it experiences a deficit in 2030.

The difference in gas supply in East Java is a surplus in the period 2022 – 2025, a maximum of 249 mmscfd due to gas production from PT XYZ, JTB and PEP increasing while demand has not increased. The period from 2026 to 2035 begins to experience a decline in piped gas production due to an increase in demand along with the planned operation of the Tuban GRR as shown in Figure 7 scenario 2. The estimate uses scenario 3, taking into account gas demand from West Java, in line with the planned realization of the Semarang - Cirebon gas pipeline. . West Java supply conditions, mostly supplied by the Sumatra region. Regionally, gas allocation is separate from East Java and Central Java. Gas supply to the fertilizer industry has decreased due to the potential decline in KEI's gas production, gas supply to PGN's industry has increased in line with industrial developments and industrial gas pricing policies. PT XYZ's gas production will increase in 2022 – 2026 as fields B and C produce up to 318 mmscfd. In the 2022-2028 period, there will be excess supply resulting in tight competition and decreased bargaining position. This condition needs to determine the main and back-up gas buyers. In the period 2029-2035, there will be excess demand, the gas market will be relatively safe for suppliers and the bargaining position will increase. Growing demand and declining gas-reserve- replacement ratios support market model predictions of rising natural gas prices (Weijermars, 2011). It is necessary to optimize production and adjust GSA contracts for gas suppliers and buyers. The condition of the stock filling ratio of piped gas in East Java can be explained as listed in Table 2.

Sales Gas Optimizing Strategy

To optimize sales, it is necessary to determine gas buyers in East Java based on the Analytical Hierarchy Process (AHP) method used interviews with three natural gas marketing experts with more than seven years of experience, with the target of compiling criteria and determining priorities for gas buyers. Then performed consistency test to get the specified CR value. The initial stage in carrying out the AHP method. The goal set is to determine gas buyer priority based on volume absorption, duration of contract, gas price, energy alternative, infrastructure and reputation. The sectors is part of East Java industries sectors use natural gas as main business, based on interview there are four sectors i.e fertilizer, various industry, electricity and gas plant in East Java. For alternatives company use gas have five alternatives based on experts judgement.

The results of the AHP show (Figure 5) that the criteria for the number of volumes of gas absorption are the top score criteria in determining gas buyers (0.412), followed by stability and duration of gas utilization (0.223) and price (0.160). The order of the fertilizer and petrochemical sectors is the main sector with a weighting value of 0.423, followed by various industry (0.289) and electricity with a weighting of 0.178. Consistency has met the requirements with a CR value 0.1% for all alternatives and criteria's. Alternative options for gas buyers with weights as Table 3.

Based on the results of the AHP analysis and in-depth discussions with experts on alternatives and criteria for volume, price, time, the gas sales reference can be formulated as in Table 4. The volume, period and price of gas refer to the reference of Ministerial Decree 134/2021 by adjusting to the conditions of East Java gas supply and demand.

Table 2. Fulfilment ration and PT XYZ positioning

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Gas Supply (MMSCFD)	542	764	887	891	825	776	690	650	608	530	437	360	314	295	267
Gas Demand (MMSCFD)	598	598	590	590	593	603	604	600	592	589	593	594	595	595	596
Deviation (MMSCFD)	-56	166	297	301	232	173	86	50	16	-59	-156	-234	-281	-300	-329
Average Deviation (MMSCFD)	-56			249				53.2					-260		
Fulfillment Ratio	0.91	1.28	1.50	1.51	1.39	1.29	1.14	1.08	1.03	0.90	0.74	0.61	0.53	0.50	0.45
Gas Supply PT XYZ	100	260	270	288	318	317	301	264	221	209	190	144	110	90	60
Gas Supply PT XYZ in JATIM (%)	18%	34%	30%	32%	39%	41%	44%	41%	36%	39%	43%	40%	35%	31%	22%

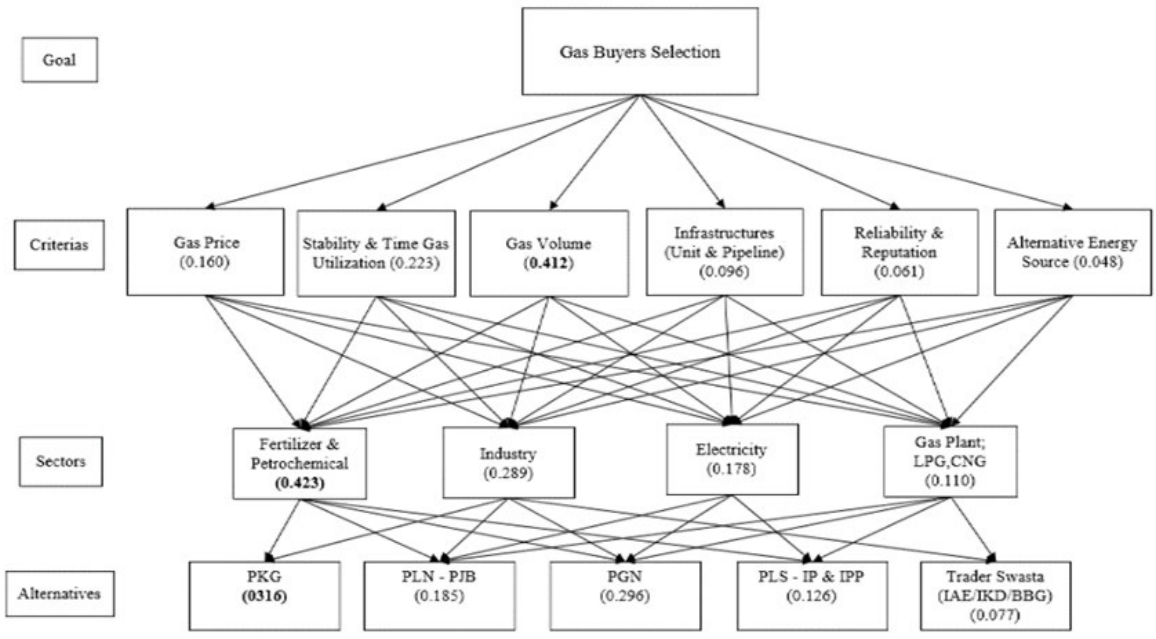

Figure 5. Hierarchy and weighted score AHP of Gas buyer segmentation

Table 3. Gas buyers alternative weights score

Gas buyer alternative	Weight
PKG Fertilizer	0.316
PGN Industry	0.296
Perusahaan Listrik Negara (PLN)	0.185
Power Plant IPP	0.126
Gas Trader	0.077

Table 4. Gas buyer formulation

Alternatives	DCQ Volume (mmscfd)	Contract Time (Year)	Price (US$/ mmbtu)
PKG Fertilizer	115	4 - 10	6.5 -7.14
PGN Industry	80	5 - 20	7 - 7.14
Power Plant	10 - 20	10	7
Gas Trader	90	5 -10	7 - 7.3

The combination of the AHP results with the model scenario for PT XYZ's gas supply and demand and the potential gas demand from each gas field is depicted in Figure 6 based on focus discussion with internal PT XYZ in between production, marketing and commercial team members to optimize gas sales revenue. The focus discussion to collect opinion and have strategy implementation. Production department focus to maintain and develop gas supply as per target. Marketing team to analysis market, maximize gas sales based on gas buyer criteria and selection. Commercial team to calculate and determine revenue. The demand scenario is fixed and the supply scenario is optimistic, moderate and pessimistic based on gas production capability.

The optimistic scenario is that by developing and revitalizing gas wells in fields A, B and C and the potential delay in production from the JTB and PEP Lengo fields, this will allow PT XYZ to supply gas to gas buyers for the JTB and PEP Lengo fields through gas traders. PT XYZ is not in a moderate scenario without developing a new field, but revitalizing existing gas wells and producing the JTB and PEP Lengo fields. Pessimistic scenario without development and without revitalization of wells. Pessimistic conditions can result in stagnant supply and possibly an unexpected decline in production or even faster decline in supply. In the long term, the sustainability of PT XYZ's natural gas business is expected up to ten years with the assumption that there will be no development of new gas wells. Based on current gas wells reservoir capability.

Total gas supply are from field A is 110 mmscfd, field B 98 – 197 mmscfd and field C is 50 mmscfd per POD. Allocation gas demand based on Kepmen 134/2021 instruction after negotiation with gas buyer. The reference scenario assume the gas lifting run as per plan from field A, B and C without delay. Gas buyers volume nomination arranged optimist supply scenario to meet 100% or above nomination by the contract agreement. The optimistic scenario gives the company a higher output revenue value than the other two scenarios. The revenue value refer to the total volume each scenarios for the optimistic scenario is more then 0.1% then others scenarios. Volume allocation and contract period for fertilizer is bigger than the PGN industry, electricity and traders are expected to have higher revenue. The allocation gas for trader is more then electricity purpose because of PLN have contract with others suppier refer to Kepmen 135, the best alternatives are used gas trader as third alternatives prior to PLN even though by AHP research PLN is third priority. This decision based on combination strategy using AHP and focus group discussion with expert from internal and external PT XYZ. The concern is due to political economic policy from government, swing gas allocation to electricity through gas trader is can optimized and utilized gas balanced from PT XYZ.

Managerial Implication

Gas sales optimization needs to be consider of gas production capability. Maintaining gas field production A to keep operating at 100 mmscfd until 2032 and accelerating the development of gas fields B and C in 2022, as well as carrying out optimistic scenarios by developing new wells and revitalizing existing wells.

Optimizing pipe gas sales by negotiating contract agreement Gas Sales Agreement (GSA) extensions or amendment to the PKG fertilizer industry and PGN industry as the main buyers and negotiating GSA to gas traders and the electricity industry regarding volume, utilization period and consideration of gas prices so that PT XYZ gas absorption becomes optimal.

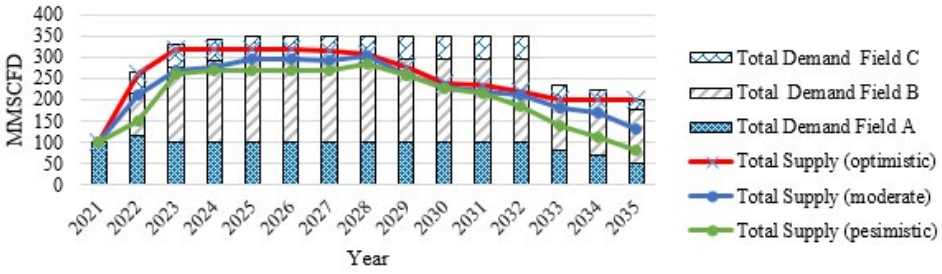

Figure 6. PT XYZ Gas Sales Scenario

CONCLUSION AND RECOMMENDATIONS

Conclusion

Natural gas supply in East Java is influenced by existing natural gas production, new gas discovery. The largest gas demand in East Java is by the fertilizer industry, electricity, industry by PGN supply, gas traders as well as the industrial potential of Central and West Java related interconnection pipeline. Natural gas supply in East Java from 2022 to 2025 there will be an oversupply of 249 mmscfd. Gas demand will increase in 2026 to 2031. In 2031-2035 there will be a gas shortage of 260 mmscfd.Optimizing strategy for gas sales of PT XYZ by determining buyers with the priority of the fertilizer industry, PGN industry and gas traders as the main buyers. Allocation to electricity through gas trader is more potential than direct to PLN due to government policy. The optimistic scenario accompanied by the development and revitalization of gas wells is the best option.

Recommendations

This research has limitation to measure intangibles area that potential affected to gas market, need to identify the intangibles for which we can develop feasible measurement criteria (trying not only to measure tangible such as physical infrastructure, supply and demand). Among the intangibles whose value relevance will be assessed using simple measurement criteria would be: gas price prediction, customer related intangibles (customer loyalty, market share and political approach). Cumulative investments interest for local and foreign investor in upstream and downstream gas sector in Indonesia. Policy of renewable energy and energy alternative outside of natural gas energy. Further research can be formulation through analysis of the company's strengths and weaknesses in Java area is needed to develop a more comprehensive strategy especially in gas marketing strategy.

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