DETERMINATION OF NATURAL GAS PRICING THROUGH PIPELINE IN DOWNSTREAM BUSINESS ACTIVITIES FOR COMMERCIAL CUSTOMERS IN WORK AREA SOR II SOUTH SUMATERA-WEST JAVA (SSWJ)

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ABSTRACT
Indonesia is a developing country that still depends on fossil fuels. Natural gas is one of the energy sources used as an alternative fuel for Indonesia's future to support national energy needs. This is because the amount of natural gas reserves in Indonesia are still classified as safe for the next several decades with increasing demand. The government has imposed a gas price for industry of USD $6 per MMBTU in accordance with the implementation of Presidential Regulation Number 40 of 2016 concerning Natural Gas Pricing. This strategic policy is believed to be able to boost the competitiveness of the domestic manufacturing sector so that it will make a significant contribution to the national economy. However, on the business entity side, this policy is considered to be detrimental because it is still unclear about the government intensive that is given to business entities. The purpose of this study is to analyze a case regarding the determination of the downstream selling price of natural gas for industrial costumers which should be in accordance with the parameters of the downstream selling price of natural gas. The results (output) obtained from this study indicate the process of optimizing the selling price of natural gas in downstream business activities to obtain the ideal value.

Keywords: Natural Gas, Customer, Natural Gas Selling Price Parameters

INTRODUCTION
The Natural gas is a vital component in world energy supply management. Compared to other fossil materials, natural gas is considered the cleanest energy source, because it has a low carbon intensity. Indonesia is one of the world's largest natural gas producing countries and is experiencing rapid development. Natural gas provides a very large contribution to state revenues. Natural gas...
contributes more than 50% of total state revenue. This contribution makes the natural gas sector the backbone of the nation's economy. Revenues from oil and gas enable the government to drive development in Indonesia by carrying out development aimed at improving people's welfare. Natural gas is also an important source to encourage the development of other industries. Indonesia has a number of fossil energy sources. In addition to oil which has been explored and produced for more than decades, natural gas is also a mainstay. Now, when oil production tends to stagnate, natural gas production continues to increase. In addition, the level of public consumption of natural gas continues to increase from year to year. This is partly due to the reduction in fuel subsidies, the development of industries that process natural gas, and also due to the issue of environmental pollution due to the use of fuel oil. Every year natural gas has increased as a source of state revenue. Since 1977 Indonesia has become a major player in the natural gas business with 1.53% of world gas reserves. Indonesia's liquefied natural gas (LNG) exports amounted to 28.36%, while the rest was used for various sectors such as the use of gas for power plants by 12.78% and for industrial needs by 36.19% and exports using pipes by 11.33%. The mix of energy use from natural gas in 2025 is targeted at 22% and 24% in 2050. Now gas plays an important role in the energy mix. (Dewan Energi National Dr.Ir. Djoko Siswanto M.B.A)

LITERATURE

Natural gas business activities are a type of public infrastructure activity (public utilities), which contain the right activities to be carried out in a monopoly and activities that have the potential to be competed. Therefore, its implementation requires the application of two economic concepts simultaneously, namely economic regulation (economic regulation) and liberal economics (economic liberalism), with the aim of making these business activities more efficient and protecting the interests of the community. The business activity of providing gas pipeline infrastructure or the business activity of transporting gas through pipelines is a natural monopoly business activity. In natural gas transportation activities, there are several types of tariff systems for transporting natural gas through pipelines, namely distance tariffs, postage stamp tariffs, and entry-exit tariffs. Thus, because the pipeline network is naturally monopolized by only one business entity, in order to prevent abuse of power from the company that owns the network, the profit or income of the company that owns the network needs to be regulated or limited through the determination of the toll fee determined by a Regulatory Body.

Stipulation of Regulation of the Minister of Energy and Mineral Resources Number 58 of 2017 concerning Selling Prices of Natural Gas Through Pipes in Oil and Gas Downstream Business Activities. This stipulation is to implement the provisions of Clause 72 of Government Regulation Number 36 of 2004 concerning Oil and Gas Downstream Business Activities as amended by Government Regulation Number 30 of 2009 concerning Amendments to Government Regulation Number 36 of 2004 concerning Oil and Gas Downstream Business Activities. The regulation regarding the Selling Price of Downstream Natural Gas in this Ministerial Regulation, as stated in Clause 2, aims to:

a. Increase the use of natural gas for domestic needs
b. Ensure the fulfillment of the rights of natural gas consumers
c. Ensure the certainty of the downstream natural gas selling price by taking into account the purchasing power of natural gas consumers, the continuity of the supply and distribution of natural gas and a reasonable economic level for the Business Entity Holding the Oil and Gas Business License.

Clause 3 states that the selling price of downstream natural gas as regulated in this Ministerial Regulation consists of:

a. Downstream Natural Gas Selling Price for the supply of electricity and industry.
b. Downstream Natural Gas Selling Price for households and small customers
c. Downstream Natural Gas Selling Price for the supply of gas fuel for transportation.

Clause 5 stipulates that the cost of managing natural gas infrastructure includes the costs incurred from the following activities

a. Natural Gas transportation through transmission and/or distribution pipelines.
b. Distribution of Natural Gas through distribution pipelines to support natural
gas trading business activities (dedicated downstream).
c. Natural gas liquefaction
d. Natural Gas Compression
e. Regasification
f. Liquefied Natural Gas/Compressed Natural Gas Storage
g. Transportation of Liquefied Natural Gas/Compressed Natural Gas

The cost of managing natural gas infrastructure from the imposition of costs arising from the transportation of natural gas through transmission and/or distribution pipelines, is calculated with the following provisions:

1. IRR is set at a maximum of 11% in United States dollars.
2. Trading Fees are set at a maximum of 7% of the Natural Gas Price

And the Indicator economy formulas for managing natural gas. Net Present Value (NPV) it is necessary to analyze the net present value of money (NPV) of a cash flow. NPV can show the amount of net profit that is valued at the present time which is calculated based on a certain interest rate. Present Value can be expressed by:

\[ C = \frac{S}{(1 + i)^n} \]  
\[ (II.1) \]

\[ NPV = C_0 + \frac{S}{(1 + i)^1} + \frac{S}{(1 + i)^2} + \ldots + \frac{S}{(1 + i)^n} \]  
\[ (II.2) \]

\[ NPV = \sum_{n=0}^{\infty} \frac{S_n}{(1 + i)^n} = 0 \]  
\[ (II.3) \]

Internal Rate of Return (IRR) is the interest price that causes the amount of cash inflow to be the same as outflow if the cash flow is discounted for a certain time. The IRR price must meet the following equation:

\[ NPV = \sum_{n=0}^{\infty} \frac{S_n}{(1 + ROR)^n} = 0 \]  
\[ (II.4) \]

The formula for natural gas pricing according to Regulation of the Minister of Energy and Mineral Resources No.58 of 2017;

\[ \text{Harga jual} = \text{harga gas bumi} + \text{biaya infrastruktur + biaya niaga} \]  
\[ (II.5) \]

**METHODOLOGY**

This research was conducted with the aspect of the calculation method according to the Regulation of the Minister of Energy and Mineral Resources of the Republic of Indonesia NO.58 of 2017. The first step taken was a literature study. This literature study is a study of the background of the importance points of this research on the development of the Indonesian natural gas for end user. This section is intended to find suitable materials used to analyze data which will later be taken from field data. Then it will determine from the case study as a reference and then calculate for determining the selling price of downstream natural gas for the commercial customer sector. The stages of this research method are:

a. Determine the natural gas supplier  
b. Calculate the pipe infrastructure cost  
c. Calculate the trading fees  
d. The natural gas pricing for commercial customers

**Flow diagram**

![Flowchart of Pressure Losses](image-url)
RESULT AND DISCUSSION

There are 9 oil and gas fields that supply natural gas and are channeled through transmission and distribution pipelines for all PGN customer sectors in the SOR II region in 2020 with a total realization of 529.93 BBTUD and DCQ of 569.2 with the allocation of the Decree of the Minister of Energy and Mineral Resources of the Republic of Indonesia (KEPMEN) 2021 of 480 BBTUD. Natural gas supplier is dominated by ConocoPhillips SSWJ with realization in 2020 amounting to 353.67 BBTUD with DCQ in 2021 at 412, TOP 90% and MDQ 110% with an average price of US$ 6.3/MMBtu and US$ 4/MMBtu (KEPMEN Special Price).

Infrastructure costs for the infrastructure development of Region X Jakarta assuming the planned average usage volume is 9,000 m3/month. With a minimum contract volume of 1,001 m3/month with a maximum contract volume of 10,000 m3/month with gas sales of Rp.6,000/m3. Purchase gas price Rp.2,684/m3 with a margin of Rp.3,315/m3 with a 3-month SPN rate of 5.3% and an investment rate of 11%. Then for investment costs, namely material costs and construction costs and other costs. The material cost for steel pipes, steel valves, steel fittings and flanges, metering regulation station, and other materials totals Rp.473,894,241. For construction costs such as preparation work for additional material procurement, excavation work, installation work, special/finishing work, repair work, testing work, and health safety environment (HSE) the total is Rp. 737,043,250 with other costs of Rp.437,082,617. The total cost of the entire investment in Zone X is Rp. 1,650,020,108. Then tranding fees are 7% from gas purchase.

From the calculation of the parameters for determining the selling price of natural gas that has been calculated, namely the price of natural gas plus infrastructure management plus trading costs, the selling price of natural gas for Region X Jakarta is US$ 8.56/MMBTU. By calculating the average natural gas price for the SOR II area of US$ 6.3/MMBTU with a toll fee for natural gas through the SSWJ I pipeline of US$ 1.55/MMBTU (based on BPH Migas regulation) and a total infrastructure management cost of Rp. 1,650,020,108 with an exchange rate of JISDOR Bank Indonesia of Rp. 14,460 (25/06/2021) which is in US$ 114,093 with infrastructure life time of 16 years and trading fees of US$ 0.6 of gas purchases. The following is a graph of determining the natural gas pricing of downstream business activities in Indonesia:

![Figure 2. Natural Gas Pricing (PGN, 2020)](image)

CONCLUSIONS

From the results above it can be concluded that:

1. Parameters for determining the selling price of downstream natural gas are determined by the supply price of natural gas plus infrastructure costs and trading costs.

2. From the calculation of the supply of natural gas supplying the SOR II (Jabodetabek) area, the average price is US$ 6.3/MMBTU and the price according to the Ministerial Decree (KEPMEN) is US$ 4/MMBTU for 3 gas suppliers namely Pertamina SSWJ, PHE Jambi Merang and ConocoPhillips with a toll fee of US$ 1.55/MSCF. From the results of the calculation of infrastructure costs for the infrastructure development of Area X Jakarta, it is Rp. 1,650,020,108 with the status of being eligible for investment. By comparison the price of materials and others is 40% and construction costs are 60%. From the calculation of commercial costs, the maximum commercial cost obtained is 7% of the price of natural gas.

3. From the calculation of the determination of the selling price of natural gas for area X Jakarta, it was obtained at US$ 8.56/MMBTU. Meanwhile, the average consideration price of natural gas for the SOR II (Jabodetabek) area is US$ 9/MMBTU with a maximum consideration price of US$ 9.9/MMBTU formula.
area X Jakarta, the NPV@11% value is Rp. 3,138,884,823 with an IRR value of 15.71%.

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