JAMBE: Jurnal Akuntansi Manajemen Bisnis dan Ekonomi
https://jambe.ubb.ac.id
ISSN: 3047-0277

THE EFFECT OF ENERGY CONSUMPTION ON GROSS DOMESTIC PRODUCT (GDP)

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Abstract: This study aims to determine the effect of oil, natural gas, and coal consumption on Indonesian domestic product. The research uses descriptive analysis techniques and quantitative analysis, namely multiple linear regression methods. The scope of the data used in this study is the time series data of Indonesia's gross domestic product from 1999 to 2023. The results showed that oil and natural gas consumption both had a positive and insignificant effect on gross domestic product while coal consumption had a positive and significant effect on gross domestic product.

Article Information:
Received 12 November 2024
Revised 15 December 2024
Accepted 05 January 2025

Keywords: *Petroleum Consumption, Natural Gas Consumption, Coal, Gross Domestic Product, Multiple Linear Regression.*

Introduction

Indonesia is a country blessed with abundant natural resources, both renewable and non-renewable. In accordance with the mandate of the 1945 Constitution (UUD) Article 33, all natural resources owned must be utilized to the greatest extent for the prosperity of the people, so that these resources should be the main capital in national development.

As one of the largest energy consumers in Asia, particularly among the *Association of Southeast Asian Nations* (ASEAN) member countries, Indonesia's energy needs are still dominated by conventional sources. By 2023, the nation's primary energy mix is largely derived from coal and petroleum, reflecting a high dependence on fossil energy. Coal accounts for 40.6 percent of the total primary energy mix, making it the main component in meeting national energy needs. Petroleum, which plays an important role in the transportation and industrial sectors, contributes 30.18 percent, while natural gas, which is widely used in power generation and industry, accounts for 16.28 percent. On the other hand, renewable energy, although still in the development stage, has reached 13.09 percent of the total energy mix (Ministry of Energy and Mineral Resources, 2023). This primary energy is obtained directly from natural sources without going through a significant conversion process.

High dependence on fossil fuels, particularly coal, oil and natural gas, poses a challenge to the national economy. Coal is widely used for power generation, while petroleum forms the backbone of the transportation and industrial sectors. As the availability of these energy resources decreases, there are concerns about the future viability of the economy. Various efforts have been made to anticipate potential energy scarcity, one of which is through an environmental political agenda that focuses on sustainable development and optimal resource management. In the current economic development, the use of natural

resources, especially those capable of producing energy, is an inevitable factor (Zuldareva, 2017).

In addition to its high dependence on fossil energy, Indonesia also appears to have neglected energy conservation policies in national energy management. The focus is more on providing and expanding energy access, leading to increased exploitation of fossil fuels. Energy consumption, especially fuel oil (BBM), increased faster than economic growth, causing problems such as fuel subsidies, smuggling, bootlegging, and political costs (Fariz, 2015) .

Today's economy and energy have a close relationship in today's modern economy. Energy plays a very complex and dynamic role, both for household consumption needs and the industrial sector in its production activities. Stern in Zuldareva (2017) states that energy use is a means to drive economic industrialization and the accumulation of development capital, both as a complement and substitute in producing economic outputs.

A good increase in Gross Domestic Product will strive to produce a lot of output both for consumption and export purposes, to meet the target output produced, it is necessary to have several production factors that become inputs in the production process, one of which is energy. Energy is one of the important inputs in the production process, the more output targets produced, the more the need for energy will increase, so that economic growth can also increase consumption or demand for energy (Apriliana & Tarmidi 2016) .

Indonesia's GDP *(Gross Domestic Product)* growth from 2013 to 2023 shows a diverse pattern. The highest economic growth occurred in 2023 with a figure of 20,892 trillion with the main contribution from the Transportation and Warehousing sector which experienced an increase. In contrast, in 2013, the lowest GDP was recorded at 10,543 trillion. During this period, economic growth tended to slow down. In 2020, Indonesia experienced a growth contraction of -2.07 percent due to the Covid-19 pandemic, but in 2021, GDP increased by 3.7 percent and continued to rise until 2023.

Today's economic activities cannot be separated from the use of natural resources, especially those that produce energy. Economy and energy are two things that are interrelated in the modern economy. Energy has a very complex and dynamic role in the economy, both for household consumption needs and the industrial sector in its production. With limited natural resources in the future, it is important to manage these resources well in order to create a healthy economy (Zuldareva, 2017) .

Energy is one of the most important factors of economic production and growth. The factors that determine a country's progress depend not only on its natural resources and geographical position, but also on the existence of its energy resources as a powerful force to accelerate a country's economic activities. The progress of a country depends not only on its natural resources and geographical position, but also on the existence of powerful energy sources to accelerate its economic activities. Energy consumption will continue to increase along with economic and population growth, as well as limited fossil energy sources (Pratiwi, 2021) .

Oil consumption in Indonesia continues to rise as the number of motor vehicles, population growth, and economic development significantly increase fuel demand for various sectors, including industry, transportation, and household needs. By 2023, Indonesia's proven oil reserves are estimated at 2.5 billion barrels, a sharp decline compared to 5.9 billion barrels in 1991, indicating pressure on the sustainability of domestic energy amid high national energy consumption. Data from the Directorate General of Oil and Gas of ESDM (2019) noted that as of January 1, 2019, petroleum reserves were 3.77 billion barrels, with 68 percent being proven reserves. In conclusion, oil consumption is increasing in line with the growth of motor vehicles, population, and the economy that drives fuel demand.

In its development, data from the Special Unit for Upstream Oil and Gas Business Activities (SKK Migas) as of December 31, 2021, recorded that Indonesia's proven oil reserves were only 2.36 billion barrels.

Oil consumption in 2013-2023 tends to decrease. The largest consumption was in 2019 where oil consumption reached 50,559 kilotons due to increased use of private

vehicles. The lowest consumption in 2021 was 43,886 kilotons, this was caused by the Covid-19 pandemic due to the implementation of the Community Activity Restriction Treatment (PPKM).

As well as oil, Indonesia is a significant producer of natural gas with advantages over other energy sources. Natural gas is abundant and sustainable, resulting in lower emissions and more efficient energy conversion costs than oil and coal. While petroleum is readily available and coal is cheaper, it has a greater environmental impact. Therefore, natural gas has great potential to become an important part of Indonesia's energy mix. Apart from several advantages, natural gas has problems for Indonesia's economic growth including infrastructure limitations, prices and subsidies, competition with other energy sources, environmental impacts, and technological limitations. Addressing these issues requires infrastructure development, efficient pricing policies, investment in technology, and good environmental management. (Azis *et* al, 2014) .

Natural gas still plays an important role as one of the energy sources in Indonesia. Natural gas utilization currently reaches 23% and based on the National Energy Policy, it is targeted to reach 24% by 2050. With Indonesia's sizable oil and gas reserves, natural gas utilization is expected to increase to 30-35%. The portion of natural gas to meet domestic needs has increased every year (Ministry of Energy and Mineral Resources, 2021).

Natural gas consumption in 2013-2023 tends to decrease. The largest consumption in 2015 where natural gas consumption reached 59,330 billion cubic meters due to increased production and infrastructure, energy diversification policies, industrial growth, government policy support, LNG export expansion, and awareness of clean energy. The lowest consumption in 2022 at 41,610 billion cubic meters is due to limited infrastructure, focus on oil and coal, less developed industries, unsupportive energy policies, and low domestic demand.

Indonesia's coal potential and reserves are spread across various regions, especially on the islands of Kalimantan and Sumatra. The domestic use of coal includes the need for power generation and industry, as well as for export abroad, which is expected to continue to increase. By 2023, Indonesia is among the countries with the largest coal production in the world such as the United States, China, India, South Africa and Australia. According to a report by Indonesia's Ministry of Energy and Mineral Resources (MEMR), energy production in that year was still dominated by coal, which accounted for about 42.38 percent of Indonesia's total primary energy mix. Meanwhile, petroleum contributed 31.40 percent, natural gas 13.92 percent, and renewable energy 12.30 percent (Aprilia et al, 2018).

According to the *Indonesian Mining Association* (IMA), national coal reserves reach 35 billion tons with resources of 134.24 billion tons, which is estimated to meet domestic energy needs for 200 to 500 years with proper processing. As the development of renewable energy has not been significant enough, coal remains one of the main energy sources in Indonesia. There is a lot to consider as coal has impacts on the environment, health, limited resources of power, price fluctuations, and lack of energy diversification. Addressing these issues requires better environmental management, investment in renewable energy, and energy policies that support diversification. (Setiawan et al, 2020) .

Coal consumption in 2013-2023 tends to increase. The largest consumption in 2023 where natural gas consumption reaches 752,266 Kilotons, this increase is due to economic growth, dependence on coal, government policies, global energy prices, and higher infrastructure development. And the lowest consumption in 2015 amounted to 427,280 Kilotons due to limited infrastructure, dependence on oil, slow industrial development, unfavorable energy policies, and low domestic demand.

This research is based on previous research conducted by Fariz & Muljaningsih (2015) on the impact of energy consumption on economic growth in Indonesia. The results show that economic growth is affected by the total amount of energy used. Although an increase in energy consumption can increase economic growth in the short term, the effect is only temporary and insignificant in the long term. However, over a longer period of time, an increase in total energy consumption can

reduce economic growth in Indonesia, suggesting the existence of a law of diminishing returns in the use of energy as a factor of production. Therefore, policies that focus on improving demand-side energy efficiency are needed.

There have been several studies on the effect of petroleum and economic growth. The research found that economic growth is significantly positively related to energy consumption (both fuel and electricity) and CO2 emissions. An increase in economic growth tends to increase energy consumption and emissions (Agung et al., 2017). Despite rising crude oil prices, fossil energy use in Indonesia remains high due to subsidies for both fuel and electricity set by the government (Pratiwi, 2022). Fuel demand continues to increase every year, indicating the need for efforts to improve fuel use efficiency, control consumption, and gradually reduce fuel subsidies (Fitriyatus et al., 2018).

Meanwhile, natural gas has a significant impact on the economy. Research shows that Indonesian and global natural gas prices are key factors influencing its production. Natural gas demand from PLN and the urea fertilizer industry is influenced by different factors, but subsidies have been shown to increase demand in both sectors (Azis et al., 2014). Natural gas consumption plays an important role in Indonesia's economic growth, particularly in the industrial and household sectors (Zuldareva, 2017). Although natural gas is an important production sector, it should be noted that this resource is limited and will be depleted in the future, requiring strategies to maintain long-term growth (Fahriza & Hartono, 2018).

Meanwhile, the influence of coal and economic growth Research conducted by Setiawan (2019) and Aprilia et al. (2018) show that in Indonesia, coal use is influenced by Gross Domestic Growth (GDP). They found a positive relationship between GDP and coal consumption, suggesting that as the economy grows, coal consumption also increases. Emilia and Mustika (2018) confirmed that coal remains the main energy source that has a significant influence, and its share in the energy mix continues to increase.

It can be concluded that the level of energy consumption of petroleum, natural gas and coal for thirty-one years tends to increase high while the level of economic growth tends to increase low. This is not in line with the fact that energy consumption should increase, while economic growth should increase. Which is where the presence of energy is currently crucial in encouraging economic growth and development of a nation. Adequate energy availability is an important need for society to achieve sustainable economic development.

Based on the explanation of the background that has been described and based on the independent variables consisting of consumption of petroleum, natural gas, coal, while economic growth is the dependent variable, researchers are motivated to analyze and find out **"The Effect of Energy Consumption on Economic Growth in Indonesia"**.

Literature Review

A. Consumption

Keynes' consumption theory states that: a person's expenditure on consumption and savings is influenced by his income. The greater a person's income, the more the level of consumption will be, and the level of savings will also increase and vice versa if a person's income level is getting smaller, then all of his income is used for consumption so that the savings rate is zero (Prastika, 2023).

B. Economic Growth

Economic growth is the process of increasing output per capita in the long run. The emphasis is on three aspects, namely the process, output per capita and the long run. Here we see the dynamic aspect of an economy. Thus, economic growth measures the performance of an economy's development. From one period to another the ability of a country to produce goods and services will increase (Norlita, 2018).

C. Energy Consumption

Energy consumption is the use of energy to facilitate human life. Higher energy use can be caused by rapid economic growth, population growth, and the advancement of technological development. The use of energy cannot be separated from human thinking to facilitate a job and want a profit or high economic value (Afriyanti et al., 2018)
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D. Framework of Thought

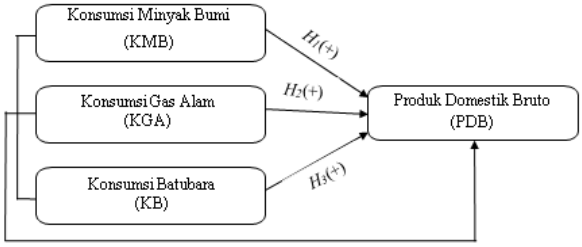

Figure 1. Framework of Thought
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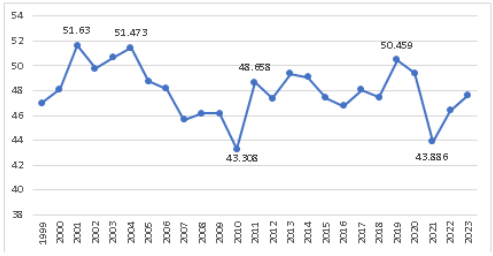


Figure 2. Oil Consumption in Indonesia 1999-2023 (Kiloton)
Source : Indonesia Energy Information, 2022

Methods

This research is a type of quantitative research. This research was conducted at the following place and time. This research was conducted at the University of Bangka Belitung through the official website of the Central Statistics Agency (BPS) and the *Handbook of Energy & Economic Statistics of* Indonesia by collecting data on , natural gas, coal and GDP energy consumption in Indonesia. This research was conducted in December 2023 until completion. With an observation period of the last 25 (twenty-five) years from 1999 to 2023.

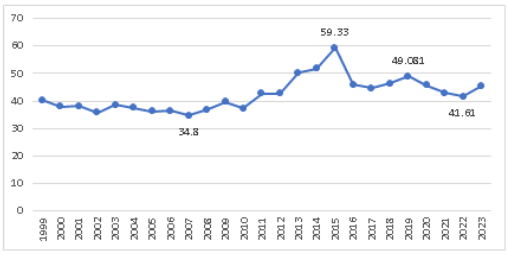
The type of data used in this research quantitative data. The data used are data on Indonesia's gross domestic product, and energy consumption of oil, natural gas and coal. Data analysis was conducted for 25 (twenty-five) years from 1999 to 2023 obtained from (BPS) and the Ministry of Energy and Mineral Resources. The population in this study consists of annual GDP seiluiruih, and energy consumption of oil, natural gas and coal in Indonesia. This study took a sample of 25 (twenty-five) samples with data from 1999 - 2023. The study took a sample of 25 (twenty-five) samples due to data reliability.

The data collection technique used by the researcher in this research is seikuindeir data, with the method of literature study and documentation. The data analysis technique used is multiple linear regression analysis, classical assumption test (autocorrelation test, normality test, heteroscedasticity test, and multicollinearity test), hypothesis testing (partial test, simultaneous test, and determination coefficient test).

Results and Discussion

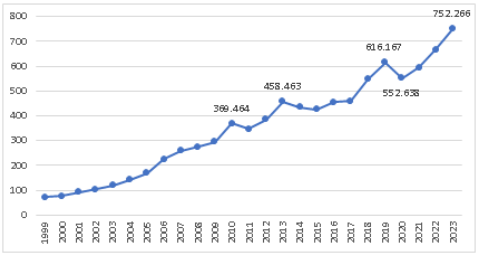
A. Development of Research Variables

Figure 1 Petroleum consumption from 1999 to 2023 shows that although it fluctuates up and down, consumption has remained at a modest level over the past 25 years.



Natural Gas Consumption in Indonesia, 1999-2023 (Billion Meters) Cubic)
Source : Indonesia Energy Information, 2022

Figure 3 Natural gas consumption from 1999 to 2023 shows an increasing trend, along with changes in energy consumption patterns in Indonesia.



Coal consumption in Indonesia 1999-2023 (Kilotons)
Source : Indonesia Energy Information, 2022

Figure 4 Coal consumption by sector from 1999 to 2023 shows a significantly increasing trend.

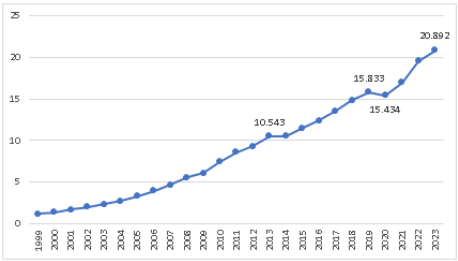


Figure 5. Indonesia's Gross Domestic Product at Current Prices Year 1990-2023 (Trillion)

Source: Indonesia Central Bureau of Statistics,

Prob. Chi-Square	0.0512
Prob. F (3,29)	0.6864
Prob. Chi-Square (3)	0.6444
Prob. Chu-Square (3)	0.7505

2023 Data processed

Figure 5 shows the growth of Indonesia's GDP (Gross Domestic Product) from 1999 to shows the highly variable pattern of Indonesia's economic growth throughout the observed period.

B. Data Analysis

a. Classical Assumption Test

Table 1. Normality Test Results

Source: Research Results, processed by researchers (2024)

Based on Table 1, it is known that the probability value of the normality test results is 0.672104, which means that it is> 0.05 so it can be concluded that the data in this study are normally distributed.

Table 2. Multicollinearity Test Results

Variable	*Centered VIF*
C	NA
LOGKMB	1.366263
LOGKGA	1.930338
LOGKB	2.191623

Source: Research Results, processed by researchers (2024)

Based on Table 2, it shows that all independent variables, namely Petroleum, Natural Gas, and Coal Consumption, have a *Centered* VIF value of .366263, 1.930338, and 2.191623 < 10. So it can be concluded that there are no multicollinearity symptoms in this study.

Table 3. Autocorrelation Test Results

Source: Research Results, processed by researchers (2024)

In Table 3, it can be seen in the Chi-Square probability value of 0.0512, where the probability value is greater than the error rate of 0.05 so it can be concluded that this study does not occur autocorrelation.

Table 4. Heteroscedasticity Test Results

Source: Research Results, processed by researchers (2024)

In Table 4, it can be seen that the Chi-Square probability value of each variable is> 0.05, so it can be concluded that this study does not have heteroscedasticity.

b. Multiple Linear Regression Analysis

Table 5. Multiple Linear Regression Analysis Results

Probability	0.672104

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	-14.91137	5.080401	-2.935078	0.0079
LOGKMB	0.477985	0.499633	0.956673	0.3496
LOGKGA	0.319693	0.193714	1.650339	0.1138
LOGKB	1.204338	0.038896	30.94816	0.0000

Source: Research Results, processed by researchers (2024)

The results of the analysis on multiple linear regression calculations can be seen in Table 4.5 by referring to the multiple linear regression equation formula, the following equation is obtained:

LOGPDB= $\alpha + \beta_1 LOGKMB + \beta_2 LOGKGA + \beta_3 LOGKB + e$

= -14.91137 + 0.*477985LOGKMB*+ 0.*319693LOGKGA*

= 1.*204338LOGKB*

The regression equation above can be explained as follows:

1. The coefficient C (intercept) of 14.91137 indicates that if the consumption of oil, natural gas, and coal is zero in

logarithmic form, the base value of GDP is 14.91137 percent.

F-Statistic	733.1466
Prob (F-Statistic)	0.000000

2. The coefficient value on Petroleum Consumption is 0.477985 percent, indicating that any increase in petroleum consumption by 1 (One) percent will increase GDP by 0.477985 percent assuming other variables remain constant or ceteris paribus.
3. The coefficient value on Natural Gas Consumption is 0.319693 percent, indicating that any increase in Natural Gas consumption by 1 (One) percent will increase GDP by 0.319693 percent assuming other variables remain constant or ceteris paribus.
4. The coefficient value on Coal Consumption is 1.204338 percent,

Adjusted R-squared	0.989191

indicating that every increase in Coal consumption by 1 (One) percent will increase GDP by 1.204338 percent assuming other variables remain or ceteris paribus.

c. Hypothesis Test

Table 6. t Test Results (Partial Test)

Variable	*t-Statistic*	*Prob.*
C	-2.935078	0.0079
LOGKMB	0.956673	0.3496
LOGKGA	1.650339	0.1138
LOGKB	30.94816	0.0000

Source: Research Results, processed by researchers (2024)

Based on Table 6, there are t or partial test results from each variable, the analysis of these tests can be described as follows:

- H_1: Petroleum consumption has a positive effect on gross domestic product.
- H_2: Natural Gas Consumption Has a Positive and Significant Effect on Gross Domestic Product.
- H_3: Coal Consumption Has a Positive and Significant Effect on Gross Domestic Product.

Table 7. F Test Results (Simultaneous Test)

Source: Research results, processed by researchers (2024)

Based on Table 7, the results of the F test obtained an F-statistic of 733.1466 which will be compared with the value of F $_{table}$, which aims to see the effect of independent variables, namely Petroleum, Natural Gas and Coal Consumption on Gross Domestic Product.

- H_4 : There is a positive and significant influence between the consumption of petroleum, natural gas, and coal on gross domestic product.

Table 8. Results of the Coefficient of Determination (R^2)

Source: Research results, processed by researchers, (2024)

Based on Table 8, the coefficient of determination or Adjusted R-squared of 98.9191 percent shows that the consumption of petroleum, natural gas, and coal is able to explain almost all variations in Indonesia's GDP, while the remaining 1.0809 percent is influenced by other factors outside this study. These factors include economic policy, non-energy sector development, global conditions, and social and environmental aspects.

C. Discussion

a. The Effect of Oil Consumption on Economic Growth in Indonesia

Based on the research analysis above, petroleum consumption shows a positive and insignificant impact on economic growth, which means that an increase in petroleum consumption has a strong potential to drive an increase in Gross Domestic Product. This happens because petroleum is still one of the main energy sources that support various productive sectors in Indonesia, such as the transportation, industry, and infrastructure sectors, which rely heavily on the availability of petroleum energy to run their operations. With the use of petroleum, these sectors can

operate more efficiently and productively, which in aggregate can accelerate national economic growth and development.

The results of this study are in line with research conducted by Fariz (2015) Describing that the value of petroleum consumption has a positive and significant effect on the value of gross domestic product, Agung et al (2017) This study found that economic growth is significantly positively related to energy consumption (both fuel and electricity) and CO2 emissions. The increase in the value of gross domestic product tends to increase energy consumption and emissions, and Alim (2022) this study explains that the value of petroleum consumption has a positive and significant effect in a certain period of time on the value of gross domestic product in Indonesia.

There are several factors that cause the relationship between petroleum consumption and GDP to sometimes be insignificant. One of them is the volatile world oil price fluctuations, which can affect the volume of oil exports as well as the revenue generated. A decrease in export volume or an increase in global oil prices can also depress the domestic economy, reduce the accessibility of sectors that rely on oil, and ultimately suppress the significant impact of oil consumption on GDP.

In addition, the scarcity of petroleum reserves or limited access to domestic petroleum can also add to the challenge of maintaining a stable contribution to economic growth.While petroleum consumption has great potential to support economic growth, external factors such as oil prices, export volumes, and limited petroleum availability can reduce this positive impact and affect the relationship of petroleum consumption to overall GDP.

b. The Effect of Natural Gas Consumption on Economic Growth in Indonesia

Based on the above research, natural gas consumption has a positive relationship with Indonesia's economic growth, indicating that when natural gas consumption increases, economic growth also tends to increase. This indicates that natural gas can contribute optimally to economic productivity, especially since natural gas is a cleaner and more efficient energy source than other fossil fuels such as oil or coal. With the increased use of natural gas, various productive sectors can be further developed, especially the manufacturing, transportation, and power generation sectors, which greatly benefit from the efficiency and stability of natural gas energy supply. These sectors become more productive, which in turn accelerates growth and strengthens national economic activity.

The results of this study are in line with research Based on research conducted by Zuldareva (2017) Natural gas consumption plays an important role in Indonesia's economic growth and gross domestic product value, especially in the industrial and household sectors, Fahriza & and Hartono (2018) Although natural gas is an important production sector, it should be noted that this resource is limited and will run out in the future, so it needs a strategy to maintain long-term growth, and Pratiwi (2020) explains that Natural Gas Consumption has a positive and significant effect on Economic growth and gross domestic product value.

Research shows that although there is a positive relationship, the impact of natural gas consumption on Indonesia's GDP has not been significant. This could be due to several main factors. First, the share of natural gas use in Indonesia is still relatively small compared to other energy sources, so its contribution to the overall economy is limited. Second, the low level of investment in the natural gas sector limits the development of infrastructure and technology needed to expand domestic consumption. Third, Indonesia's slow energy transition has made the process of adapting to clean energy such as natural gas gradual, so the positive impacts are not fully felt in the short term. Finally, Indonesia's natural gas is currently predominantly exported rather than utilized for domestic consumption, resulting in most of the economic benefits of natural gas not being directly felt by the domestic economy.

So improving energy efficiency and the adoption of energy-efficient technologies in the industrial sector is a priority, to be accompanied by research and development of new technologies to maximize natural gas productivity. Public education is also needed to encourage wider use of natural gas, including in the transportation sector. Regular monitoring and evaluation of the contribution of natural gas to GDP is conducted to adjust policies to optimize and sustain its impact on

economic growth. This step aims to ensure that natural gas becomes the main driver of Indonesia's economic development.

c. The Effect of Coal Consumption on Economic Growth in Indonesia

Coal consumption has a very significant role in driving economic growth and increasing Gross Domestic Product (GDP) in countries that depend on this fossil energy, especially in supporting industrial sectors and power generation. Several theories support that coal consumption has the potential to positively impact GDP through several main channels. Based on the *Energy-Growth Hypothesis,* coal consumption directly contributes to an increase in economic output due to its pivotal role in meeting industrial and transportation energy needs. In addition, coal also serves as a key input in energy production that supports industrialization, in accordance with the Cobb-Douglas Production Function Theory that emphasizes the importance of coal as a factor in increasing industrial sector productivity.

Based on the research results described above, coal has proven to be one of the most important and dominant energy sources in Indonesia, with its main role in various economic sectors, especially in power generation and the manufacturing industry. In the context of economic theory, energy resources that are available in large quantities and at affordable prices have a significant impact on economic activity, as they can encourage increased production, investment and expansion of the industrial sector. Thus, cheap and abundant energy has the potential to increase the competitiveness of the economy, stimulate sustainable economic growth, and open up new investment opportunities. Coal, which is abundantly available in Indonesia at relatively low prices, plays a very strategic role in maintaining the stability of domestic energy supply and lowering production costs for industrial sectors. This, in turn, contributes to increasing the volume of industrial output and improving overall economic efficiency, which in turn can drive higher economic growth.

The results of this study are in line with research conducted by Setiawan (2019) and Aprilia et al. (2018) showed that in Indonesia, coal use is influenced by Gross Domestic Product (GDP). They found a positive relationship between GDP and coal consumption, indicating that as the economy grows, coal consumption also increases. Emilia and Mustika (2018) confirmed that coal remains the main energy source and has a significant positive effect on its share in increasing gross domestic product and economic growth.

Conclusion

Petroleum consumption has a positive and insignificant effect on Gross Domestic Product.

Natural Gas Consumption has a positive and insignificant effect on Gross Domestic Product.

Coal consumption has a positive and significant effect on Gross Domestic Product.

Overall, the consumption of , natural gas, and coal has a positive influence on gross domestic product.

Acknowledgments

Praise be to God Almighty for His grace and mercy so that the author can complete this research. This research can be completed of course not separated from the help and support of various parties. Hopefully this research can be useful for those in need. The author realizes that this research is far from perfect, therefore the author hopes for suggestions and input so that this work is more appropriate and useful.

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