Faculty of Economics and Business
Universitas Pamulang
INTERNASIONAL CONFERENCE & CALL FOR PAPER
ECONOMICS, BUSINESS, INNOVATION AND CREATIVITY (EBIC), 30th April 2025
Vol : 2 No.: 1 No. E- ISSN: 3025-4086

ANALYSIS OF GOVERNMENT BUDGET EFFICIENCY IN SUPPORTING RENEWABLE ENERGY PROJECTS IN INDONESIA PERIOD 2020-2024

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ABSTRACT

This study aims to analyze the efficiency of government budget allocation in supporting renewable energy projects in Indonesia during the period of 2020 to 2024. The research is based on the urgency of transitioning to clean and sustainable energy sources, and the role of national budgets in facilitating the development of renewable energy sectors. A descriptive quantitative method was applied using secondary data analysis from government budget realization reports, non-tax state revenue (PNBP), and the additional capacity of renewable energy. The results show a positive trend in budget efficiency despite fluctuating annual budget allocations. The highest budget allocation occurred in 2021 with Rp61.72 trillion, while in 2024 it decreased significantly to Rp6.97 billion. However, PNBP achievements remained high, and renewable energy capacity steadily increased until 2023. The budget reduction did not result in performance decline but rather indicated improved efficiency and a shift towards more sustainable financing strategies. This study concludes that budget efficiency in the energy sector can be achieved through spending optimization, funding collaboration, and stronger clean energy policy support.

Keywords: Budget Efficiency, Renewable Energy, ESDM, PNBP, Energy Policy

ABSTRAK

Penelitian ini bertujuan untuk menganalisis efisiensi anggaran pemerintah dalam mendukung proyek energi terbarukan di Indonesia selama periode 2020 hingga 2024. Latar belakang dari penelitian ini adalah pentingnya transisi energi menuju sumber daya yang bersih dan berkelanjutan, serta peran anggaran negara dalam mendukung pembangunan sektor energi terbarukan. Metode penelitian yang digunakan adalah pendekatan kuantitatif deskriptif dengan analisis data sekunder dari laporan realisasi anggaran, PNBP sektor ESDM, dan tambahan kapasitas energi terbarukan. Hasil penelitian menunjukkan bahwa efisiensi anggaran menunjukkan tren positif meskipun terdapat fluktuasi dalam besaran alokasi anggaran setiap tahunnya. Tahun 2021 mencatatkan anggaran tertinggi mencapai Rp61,72 triliun, sementara tahun 2024 mengalami penurunan menjadi Rp6,97 Miliar Namun, capaian PNBP tetap tinggi dan kapasitas energi terbarukan terus meningkat hingga 2023. Penurunan anggaran tidak menurunkan kinerja, melainkan menunjukkan efisiensi serta pergeseran strategi pembiayaan menuju model yang lebih berkelanjutan. Penelitian ini menyimpulkan bahwa efisiensi anggaran dalam sektor ESDM dapat dicapai melalui optimalisasi belanja, kolaborasi pendanaan, dan penguatan kebijakan energi bersih.

Kata Kunci: Efisiensi Anggaran, Energi Terbarukan, ESDM, PNBP, Kebijakan Energi

1. INTRODUCTION

Indonesia, as the largest archipelagic country in the world, holds an abundant potential of renewable energy sources such as solar, wind, and geothermal power. Despite this vast potential, the utilization of renewable energy in Indonesia still faces numerous challenges. One of the main obstacles is the country's high economic dependence on fossil fuels, particularly coal and petroleum, which not only dominate the national energy sector but also serve as a major source of state revenue (Kusuma, 2016). This dependence creates structural barriers to the development of renewable energy, as policies and investments continue to favor the conventional energy sector.

In the 2024 fiscal year, the initial budget ceiling allocated for the Directorate General of New, Renewable Energy and Energy Conservation (Ditjen EBTKE) was Rp450,176,827,000—a 45.8% decrease from the initial 2023 allocation of Rp830,542,593,000. From that amount, the Ditjen EBTKE budget underwent several revisions, including routine adjustments, unblocking of budget items, additional allocations for infrastructure, additional allocations from Non-Tax State Revenue (PNBP) utilization permits (IP PNBP), and an increase in funding from the ADLIGHT program's direct grant. As a result of these revisions, the total final budget allocation for Ditjen EBTKE in 2024 amounted to Rp639,791,145,000, comprising Rp603.89 billion for non-Public Service Agency (non-BLU) EBTKE and BBSP units, and Rp35.89 billion for the BBSP BLU (Public Service Agency) units.

The direction of energy policy in Indonesia is often inconsistent and lacks integration, ultimately hindering the growth of renewable energy. For instance, although there are policies that support the use of renewable energy, their implementation is frequently obstructed by complex bureaucracy and a lack of economic incentives for investors (Handayani, 2018). Overlapping regulations and frequent policy changes also create uncertainty for industry players, making investments in the renewable energy sector less attractive. Despite the various challenges Indonesia faces in developing renewable energy, there are several opportunities and strategies that can be optimally utilized to support a successful energy transition. One significant opportunity is the global push to reduce carbon emissions and address the impacts of climate change, which encourages many countries to shift toward clean energy sources. Indonesia can take advantage of this momentum by collaborating with developed countries and international organizations to gain support in the form of technology, expertise, and funding. Technical assistance from countries with advanced renewable energy technologies can help Indonesia close the technology gap and strengthen local capacity for the development and maintenance of renewable energy infrastructure (Suharsono, 2017).

Education and public awareness regarding the importance of renewable energy and its environmental impact are essential elements in promoting the adoption of clean energy. Efforts such as public information campaigns, educational programs, and workforce training in the renewable energy sector need to be enhanced to build public support for the energy transition process. With a deeper understanding of the benefits of renewable energy, the public is more likely to support government policies and initiatives and actively participate in the implementation of clean energy (Widyastuti, 2017).

Overall, a comprehensive and well-coordinated strategy involving various stakeholders is needed to overcome obstacles and maximize the potential in the development of renewable energy in Indonesia.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS

Renewable Energy

Renewable Energy refers to energy sources that originate from nature and can be naturally replenished. These sources are not depleted over time or can be restored within a relatively short period, unlike fossil fuels such as oil and coal, which take millions of years to form. Examples of renewable energy include solar power, wind energy, hydro (water) energy, geothermal energy, and biomass.

Challenges in Energi Terbarukan Development

According to Kusuma (2016), one of the main challenges is the heavy dependence on fossil fuels such as coal and oil, which serve as major sources of national revenue. Other obstacles include limited infrastructure, high initial investment costs, and inconsistent regulations (Handayani, 2018).

Energy Policy and Governance

Energy policies in Indonesia frequently change and have not yet fully supported a sustainable energy transition. Overlapping regulations and the lack of incentives for investors are major barriers to the development of clean energy (Widyastuti, 2017).

The Role of Education and International Support

Suharsono (2017) states that international support in the form of technological assistance and funding is crucial to bridging Indonesia's technological gap. In addition, public education and workforce training are needed to raise awareness and encourage community involvement in supporting renewable energy.

3. RESEARCH METHOD

This research is a quantitative study with a descriptive approach. The aim of this study is to analyze the efficiency of government budget utilization in supporting renewable energy projects in Indonesia. Through this approach, the researcher seeks to describe the actual condition of budget usage and measure the effectiveness of the budget in relation to the achievements of renewable energy projects.

Data Collection Techniques

The population in this study includes all renewable energy projects funded by the Indonesian government through Non-Tax State Revenue (PNBP) over the past five years (2020–2024). The sample was selected using purposive sampling technique, which involves selecting projects that have publicly available or officially accessible data on budgets and outputs, such as those found in reports from the Ministry of Energy and Mineral Resources (ESDM).

Operational Definitions of Variables

The variables in this study are defined as follows:

- Government Budget Realization (X): The total amount of funds disbursed by the government to support the development of renewable energy within a year, measured in trillion rupiahs (Rp Trillion).
- Additional Renewable Energy Capacity (Y): The output in the form of the amount of renewable energy capacity added within a year, measured in Megawatts (MW) or Kilowatt-hours (kWh), depending on the project type.
- Budget Efficiency**:** A performance indicator calculated based on the ratio between the realized budget and the additional energy capacity generated. This efficiency reflects how much budget is required to produce one unit of energy capacity (e.g., in Rp/MW).

Sample Collection Techniques

Data collection is carried out through documentation study, which involves accessing and reviewing data from official documents related to the budget and outputs of renewable energy projects. The sources of documentation include annual reports, policy documents, oversight reports, and publications from government agencies.

Data Analysis Techniques

The data analysis technique in this study is carried out through a quantitative descriptive approach, starting with the compilation of government budget realization data and additional renewable energy capacity from 2020 to 2024 in the form of a table. Then, the budget efficiency ratio is calculated by dividing the total budget realization by the renewable energy capacity produced each year, in order to determine the cost incurred for each unit of renewable energy generated. The results of this ratio are then compared across years to identify trends in efficiency, improvements or declines in the effectiveness of budget utilization, as well as the years with the highest and lowest efficiency levels.

4. DATA ANALYSIS AND DISCUSSION

Data Analysis

The analysis of the budget efficiency in the Energy and Mineral Resources (ESDM) sector during the 2020–2024 period shows that the budget realization generally meets or exceeds the set targets. For example, in 2021, the realization of Non-Tax State Revenue (PNBP) in the ESDM sector reached IDR 189.2 trillion, or 156% of the target of IDR 121.2 trillion. This reflects strong performance amid the challenges of economic recovery due to the COVID-19 pandemic. Additionally, in 2023, the realization of PNBP in the ESDM sector reached IDR 300.3 trillion, surpassing the target of IDR 259.2 trillion. This increase indicates the effectiveness of budget management in generating state revenue.

Budget Efficiency Analysis

To assess budget efficiency in supporting renewable energy projects, the cost per megawatt (MW) of installed capacity is used as an indicator. For instance, in 2020, an investment of USD 1.4 billion resulted in an additional renewable energy capacity of 95 MW, including projects like the Poso Hydroelectric Power Plant (66 MW) and Rooftop Solar Power Plants (13.4 MW). Thus, the cost per MW was approximately USD 14.7 million. Although this figure provides an initial overview, it is important to consider that the cost per MW can vary depending on the type of technology, project location, and scale

of development. Therefore, further analysis is needed to compare efficiency across projects and years.

Policy Implications

The analysis results indicate that the government budget has been used to generate tangible outputs in the renewable energy sector, both in terms of additional energy capacity and carbon emission reduction. However, efficiency can still be improved.
Several strategies that the government can undertake include:

- Prioritizing funding for the most cost-effective renewable energy technologies,
- Enhancing transparency and oversight in project implementation,
- Encouraging collaboration with the private sector to share the budget burden and improve effectiveness.

Table 1. Budget efficiency and performance of the ESDM sector

Tahun	Realisasi Anggaran (Rp)	Realisasi PNBP (Rp Triliun)	Kapasitas Energi Terbarukan Tambahan	Catatan
2020	5,8T	108,7	10.467 MW	PNBP mencapai 120%
2021	61,72T	189,2	11.791 MW	PNBP mencapai 156%
2022	5,89T	351,0	12.542,5 MW	PNBP mencapai 138%
2023	6,18T	300,3	13.155 MW	PNBP mencapai 116%
2024	6.966,51M	269,6	1.411 kWh	PNBP mencapai 115%

Source : capaian kinerja sektor ESDM

During the 2020–2024 period, the energy and mineral resources (ESDM) sector showed solid performance in terms of budget efficiency and performance achievements. This is reflected in the non-tax state revenue (PNBP), which consistently exceeded the annual target, with achievements ranging from 115% to 156%. In 2020, a budget realization of IDR 5.8 trillion successfully resulted in an additional renewable energy capacity of 10,467 MW. The year 2021 showed a significant spike in budget realization, reaching IDR 61.72 trillion, most likely due to the launch of the national economic recovery program (PEN), the acceleration of strategic renewable energy projects, or the adjustment of capital expenditures post-COVID-19 pandemic. However, the budget trend declined afterward, with the 2022 budget recorded at IDR 5.89 trillion and IDR 6.97 trillion in 2024. This decline is suspected to be due to increased government expenditure efficiency, the completion of major projects, and greater private sector involvement through alternative funding schemes such as the Public-Private Partnership (PPP).

This study aims to analyze the efficiency of government budgets in supporting renewable energy projects in Indonesia during the 2020–2024 period. Based on the collected data, it was found that the budget efficiency in the Energy and Mineral Resources (ESDM) sector shows a positive trend. This is reflected in the achievement of non-tax state revenue (PNBP), which consistently exceeded the annual target, with the highest achievement in 2021 at 156%. Although the budget allocation in subsequent years experienced a significant decline, from IDR 61.72 trillion in 2021 to only IDR 6.97 trillion

in 2024, the performance of the energy sector remained stable. The increase in renewable energy capacity grew from 10,467 MW in 2020 to 13,155 MW in 2023, with only a decline in 2024, which is likely due to a change in output reporting methods (from MW to kWh) or incomplete projects.

The year 2021 marked the peak of the budget allocation, which is estimated to be related to the implementation of the post-COVID-19 economic recovery program and the acceleration of clean energy infrastructure. Meanwhile, the higher budget efficiency in subsequent years was driven by the completion of large projects and increased private sector involvement through alternative funding schemes like the Public-Private Partnership (PPP).

Overall, the results of this study indicate that budget policies in the ESDM sector have begun to focus on efficiency and sustainability, with an emphasis on results (outputs) and budget optimization. The government has managed to maintain the contribution of the energy sector to state revenue and renewable energy development, despite fiscal constraints and declining budget allocations.

Discussion

This study has several limitations, such as the fact that not all budget data is published in detail per project, meaning the analysis can only be conducted by reviewing aggregate data.

5. CONCLUSION & SUGGESTION

CONCLUSION

Based on the results of the study, it can be concluded that the efficiency of the government budget in supporting renewable energy projects in Indonesia during the 2020–2024 period shows a positive trend. Although there was fluctuation in the budget allocation, with the highest spike in 2021 at IDR 61.72 trillion and a significant decline in 2024 to IDR 6.97 trillion, the energy sector's performance remained stable and even improved. This is reflected in the achievement of PNBP, which consistently exceeded the target, and the increase in renewable energy capacity over the period. This efficiency reflects increasingly targeted budget management, as well as a shift in financing strategies from direct government spending to collaborative models such as PPPs and private investments. Therefore, budget efficiency is not only reflected in the amount of the allocation but also in the government's ability to optimize funds to generate sustainable performance in the renewable energy sector.

SUGGESTION

Suggestions for future research include the expectation that upcoming studies will be able to access more detailed data and develop a more comprehensive evaluation approach that is aligned with the current situation.

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