# GREEN ECONOMIC TRANSFORMATION: ANALYSIS OF THE IMPACT OF RENEWABLE ENERGY POLICIES ON THE NATIONAL

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***Abstract:*** This study aims to analyze the impact of renewable energy policies on the national economy through the Systematic Literature Review (SLR) approach. A total of 16 articles relevant to the research topic were reviewed to explore the role of renewable energy in supporting the transformation towards a green economy. The results of the analysis show that renewable energy contributes significantly to economic growth, both directly and through the creation of a more sustainable economic model. In addition, renewable energy plays an important role in green and sustainable economic growth by reducing carbon emissions and negative environmental impacts generated by fossil fuels. The study also found that renewable energy policies contribute to improving export quality. Products produced using clean energy meet international standards, open wider global market access, and increase the added value of national exports. The conclusion of this study emphasizes the importance of synergy between government policies, the private sector, and society to optimize the benefits of renewable energy. Thus, renewable energy is not only a clean energy solution but also a main pillar in the transformation towards an inclusive and sustainable green economy.

***Keywords****: Green economy, Renewable energy, Economy*

## Introduction

Nowadays, environmental issues are inseparable from every aspect of human life. A healthy and preserved environment is something that is difficult and very rare to find, because almost every region on earth has been damaged. Greater attention is needed in environmental protection and sustainable development growth due to the increasing environmental problems faced by current and future generations (Mohamed Bouteraa, 2020).

This environmental problem is not only the responsibility of individuals or the government alone, but is a problem that must be borne together. Therefore, ideas about the green economy or green economy began to emerge to support environmental development (pro-environment), which affects the development of the economic system towards an environmentally friendly economy (Ika Yunia Fauzia, 2016).

Green economic transformation is a development approach that aims to achieve sustainable economic growth without compromising environmental quality. In the global context, the issues of climate change, environmental degradation, and social inequality are the main drivers for countries to shift towards a more environmentally friendly economic system. Indonesia, as a developing country with abundant natural resources, has a great opportunity to implement green economic transformation through renewable energy

policies. This policy not only aims to reduce greenhouse gas emissions, but also to encourage economic diversification, create new jobs, and improve national energy security.

In order to achieve sustainable environmental management, the shift from fossil energy to renewable energy is a strategic step that is expected to reduce negative impacts on the ecosystem. Clean, renewable energy sources offer great potential to produce environmentally friendly energy. The use of clean, renewable energy not only has the potential to minimize greenhouse gas emissions but can also improve air quality and public health (Rita & et al, 2025).

Indonesia, with its huge potential in renewable energy development, is one of the countries that has significant opportunities to utilize renewable energy to support environmentally friendly economic development. With a total capacity of 442.4 gigawatts (GW). This potential includes various sources, such as solar, wind, hydro, biomass, and geothermal energy. With its strategic geographical location, Indonesia has ideal conditions to utilize these energy sources, especially abundant solar and geothermal power. It is important for the government and stakeholders to raise public awareness through education and campaigns that highlight the benefits of this energy transition. Clear policies and incentives for investment in the EBT sector are also needed to attract more private participation. By optimally utilizing the potential of EBT, Indonesia will not only have its domestic energy needs met but will play a leading role in changing the global energy map towards greater sustainability and energy security (Apriliyanti & Rizki, 2023).

However, the transition to a renewable green economy is not free from challenges. These include high initial investment costs, resistance from fossil fuel-based industries, and lack of adequate infrastructure and technology. Therefore, research on the impact of renewable energy policies on the national economy is important to understand the extent to which these policies can support sustainable development goals in the world. This research will focus on analyzing the impact of renewable energy policies on economic growth, job creation, and carbon emission reduction.

## Literature Review

### Green Economy

Green Economy according to the United Nations Environment Programme (UNEP) is an economy that can improve social justice and community welfare. Green economy has the idea of eliminating the influence or negative impact of economic growth on the scarcity of natural resources and especially problems in the environment. In simple terms, this green economy is a strategy formulated in economic endeavors that does not interfere with the sustainability of nature or does not result in environmental damage. Furthermore, UNEP categorizes the achievements of the green economy in improving welfare and achieving social justice. Therefore, the interpretation of green economy is a step to achieve prosperity for every community which is the ultimate goal in carrying out economic activities so that it is expected to be able to realize justice both in the environment and the utilization of resources themselves.(R. Agung Utama & etc, 2019)

### Renewable energy

Renewable energy refers to energy sources that are naturally renewable. In essence, renewable energy is an unlimited source of energy because it can be renewed fairly quickly. Renewable energy sources originate from natural factors that are abundant on Earth, such as sunlight, wind, biomass, and water. Due to its nature, renewable energy is considered an energy source that does not pollute the environment and does not cause global warming or

climate change. There are different types of renewable energy. Technologies such as solar energy, wind, hydropower, and biomass are effective in meeting the energy needs of remote areas. However, there are also other renewable energy sources, for example tidal and geothermal energy, which cannot always be utilized in all locations (Yanti et al., 2024).

**Impact of Renewable Energy Policy on the Economy**

Research on the impact of renewable energy policies shows mixed results depending on the country context. In developed countries, such as Germany and Denmark, these policies have successfully increased economic growth while reducing carbon emissions. However, in developing countries, the impact is more complex as it depends on factors such as infrastructure readiness, technological capacity and policy support.

Renewable energy consumption contributes positively to economic growth in Asean countries, albeit in small amounts. Meanwhile, gross fixed capital formation (GCM) also contributes positively to economic growth in Asean countries. The small effect of renewable energy consumption on economic growth can be due to the fact that Asean countries have not maximized the realization of renewable energy as an alternative to the use of environmentally friendly energy. Of course this should be a common concern, because economic activities in Asean countries that tend to use energy that is not environmentally friendly will have a considerable impact on environmental damage, of course there will be many other factors caused by environmental damage that can harm these Asean countries such as public health factors, natural disasters and so on (Tajul Ula & Affandi, 2021).

In Indonesia, several studies have identified the potential benefits of renewable energy, such as reduced dependence on fossil fuel imports, job creation in rural areas, and improved energy access in remote areas. However, challenges such as high investment costs and lack of incentives for the private sector remain major obstacles.

**Renewable Energy Policy in Indonesia**

Indonesia is a country with huge renewable energy potential, due to its astronomical influence and geographical location. Indonesia is located on the equator, which explains its tropical climate, and most of the country is exposed to the sun. Indonesia's transition efforts in developing renewable energy cannot be seen only from the revenue side, this is referred to as the development process, but on the other hand, there are several dynamic factors including social factors, oriented towards people and communities. In some areas that are developing renewable energy, there are several factors that can be a marker of successful renewable energy development and can also be an important factor for the failure of the process.

Indonesia is determined to formulate and implement a transparent and measurable National Energy Policy (KEN), aiming to be a guideline in national energy management. KEN was designed by the National Energy Council (DEN) and ratified through the approval of the House of Representatives, by Government Regulation (PP) No. 79 of 2014 (Savira Ayu Arsita et al., 2021). The principles upheld in the preparation of KEN are justice, sustainability, and environmental resilience, to create energy independence and strong national energy resilience. The goal is to increase the use of New Renewable Energy (NRE) so that it reaches at least 23% of total national primary energy by 2025 and to increase this figure to 31% by 2050. However, until the end of 2022, the achievement of the use of renewable energy in the national energy mix only reached 12.3%. Presidential Regulations (Perpres) that regulate the utilization of renewable energy, such as Perpres Number 4 of 2016 concerning the Acceleration of Electricity Infrastructure. This Perpres gives authority to the central and local governments to provide various forms of

support, including fiscal incentives, ease in licensing, determination of the purchase price of power electricity from various EBT sources, the establishment of a specialized business entity for the provision of power electricity, and subsidies (Renewable Energy Indonesia, 2023).

## Method

This research uses a qualitative approach with Systematic Literature Review (SLR) analysis. Systematic Literature Review analysis is carried out by identifying, selecting, and assessing then collecting, analyzing and synthesizing published research literature on the impact of renewable energy policies on the economy (Greenhalgh, 1997). To get a more comprehensive analysis, we started by collecting research questions. The search process was conducted by organizing the criteria in a transparent manner (Lame, 2019). This limits systematic error (bias) (Higgins et al., 2011).

### Sources and Search Terms

Database searches were conducted starting in December 2024 with a focus on databases sourced from Google Scholar on green economy transformation regarding the impact of renewable energy policies on the national economy. The search terms for the database were "green economy", "renewable energy", and "economy". Searching with keywords in the use of diverse search terms will result in too large amounts of data, so the search terms are limited to the articulation of the impact of renewable energy policies on the national economy. In addition, in terms of search refinement the term green economy was not included in the search terms, because the use of terms to describe new economic concepts that have many variations and can be an obstacle in the search for relevant studies.

### Scope and Selection Principles

The scope of this review is research on the impact of renewable energy policies on the national economy. The coverage criteria are related to language and publication. The criterion for language restriction is literature in English. There are no restrictions set for geographical areas and research results. The publication time restriction is from 2020-2024. The scope of research design includes quantitative, qualitative, and mixed research.

### Procedure

The database search procedure was conducted by providing 150 reference results including duplicated data. This process begins with adjusting the inclusion and exclusion criteria. The exclusion criteria were carried out by analyzing titles and abstracts that were about the theme of collaboration. The inclusion process is carried out by analyzing references that contain the terms green economy, renewable energy, and national economy and then assessing the quality that is relevant to the theme of this research. The selected articles only describe the impact of renewable energy policies on the national economy. The search results contained 70 references for further investigation. The next procedure is that the full text of the articles is downloaded and examined. Articles that did not meet the inclusion criteria were excluded and the results found that 16 articles met the inclusion criteria.

### Data Extraction

Articles that were selected according to the criteria were then extracted by grouping them according to: (a) author name, (b) year of publication, (c) country, (d) title, (e) research method and design, (f) results and (g) relevance of the research to the theme of the research conducted.

**Quality Assessment**

The quality of the articles was assessed through an extraction process using the principle of data synthesis. The data synthesis process began by including all relevant research. It then assessed the quality of the literature such as: (a) explicit theoretical framework and/or literature review, (b) clear aims and objectives, (c) clear description of the text, (d) clear description of the methods used to collect and analyze data.

**Results and Discussion**

A total of 16 relevant articles were collected related to the research topic. The articles are sourced from studies in several countries around the world. The impact of renewable energy consumption is analyzed both in the short and long term of its influence on the economy. Based on the analysis that has been done, it is known that renewable energy has a role in the economy by increasing economic growth, providing better export opportunities, green and sustainable economic growth, and serving for economic recovery in the country. The results of the analysis of the 16 articles are presented below.

**Table 1: Article Summary**

| Name | Titl | Results |
|---|---|---|
| Shahbaz et al., 2020 | The Effect of Renewable Energy Consumption on Economic Growth: Evidence from the Renewable Energy Country Attractive Index | The empirical analysis confirms the existence of a long-term relationship between renewable energy consumption and economic growth. In particular, renewable energy consumption has a positive impact on economic growth in 58% of the sample countries. |
| (Wang et al., 2022) | Renewable energy and economic growth: New insights from country risks | The results show that when composite risk and political risk are used as threshold variables, there is a single threshold between renewable energy consumption and economic growth. When the threshold is exceeded, the positive effect of renewable energy on economic growth increases. |
| (Yu et al., 2023) | Impact of non-renewable energy and natural resources on economic recovery: Empirical evidence from selected developing economies | Economic recovery in eight out of ten countries relies on natural resource development, while sustainable energy contributes to economic recovery in Germany, Denmark and France in the long term. |
| (S. A. R. Khan, Zhang, et al., 2020) | Measuring the impact of renewable energy, public health expenditure, logistics, and environmental performance on sustainable economic growth | The use of renewable energy in logistics can not only improve environmental sustainability but also create a better national image and provide better export opportunities in environmentally friendly countries to promote sustainable economic growth. |
| (Fang et al., | Role of research and Syed | The findings show that industrial upgrading |

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| 2022) | development in green economic growth through renewable energy development: Empirical evidence from South Asia | and research and development reduce carbon emissions and achieve green economic recovery. As a result, 33.4% of energy was saved and 35.2% of emissions were reduced. |
| (Azam et al., 2021) | Analyzing the effect of natural gas, nuclear energy and renewable energy on GDP and carbon emissions: A multi-variate panel data analysis | Natural gas, the expansion and improvement of renewable energy and nuclear energy are essential to avoid global warming and climate change and to promote economic growth. |
| (Fan & Hao, 2020) | An empirical research on the relationship amongst renewable energy consumption, economic growth and foreign direct investment in China. | Empirical results show that there is a long-run and stable equilibrium relationship between gross domestic product per capita, foreign direct investment per capita, and renewable energy consumption per capita. |
| (Wang & Wang, 2020) | Renewable energy consumption and economic growth in OECD countries: A nonlinear panel data analysis | The results show that the impact of renewable energy consumption on economic growth is positive, indicating that an increase in renewable energy consumption contributes to economic growth. |
| (Zhao et al., 2022) | Impacts of environmental regulations on green economic growth in China: New guidelines regarding renewable energy and energy efficiency | The results show that renewable energy development, an important component of green growth in China. |
| (S. A. R. Khan, Yu, et al., 2020) | Investigating the effects of renewable energy on international trade and environmental quality | The findings reveal that renewable energy is strongly and positively related to international trade in the Nordic countries. In addition, the results show that renewable energy consumption increases environmental quality |
| (Mohsin et al., 2021) | Assessing the impact of transition from nonrenewable to renewable energy consumption on economic growth-environmental nexus from developing Asian economies | The findings show a positive correlation between economic growth and energy consumption, while a 1% increase in renewable energy consumption results in a 0.193% decrease in carbon emissions. |
| (Zahoor et al., 2022) | Clean energy investment and financial development as determinants of environmental and sustainable economic growth: evidence from China | Overall, the results determine that clean energy investment is negatively associated with CO2 emissions and ecological footprint while positively associated with China's economic growth. Moreover, clean energy investment improves environmental sustainability at the expense of economic |

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|---|---|---|
| | | growth. |
| (Li et al., 2022) | Does renewable energy reduce ecological footprint at the expense of economic growth? An empirical analysis of 120 countries | The results show that global renewable energy can drive economic growth while improving the environment. |
| (I. Khan et al., 2022) | A study of trilemma energy balance, clean energy transitions, and economic expansion in the midst of environmental sustainability: New insights from three trilemma leaderships | The clean energy transition boosts economic growth and environmental sustainability. |
| (Usman et al., 2021) | Does financial inclusion, renewable and non-renewable energy utilization accelerate ecological footprints and economic growth? Fresh evidence from the 15 highest emitting countries | In the growth function, financial development, utilization of renewable and non-renewable energy significantly boosts economic growth. |
| (Baz et al., 2021) | Asymmetric impact of fossil fuel and renewable energy consumption on economic growth: A nonlinear technique | The increase in renewable energy consumption has a negative impact on long-term economic growth in Pakistan. |

Source: Author's Processed Data, 2024

Based on the articles described above, the theme of the discussion will be classified regarding the impact of renewable energy on the economy.

**The Impact of Renewable Energy on Economic Growth**

Renewable energy plays a strategic role in driving national economic growth. This is conveyed by almost all articles contained in table 1 that renewable energy has an impact on economic growth. The results of these studies include those revealed by (Islam et al., 2022; I. Khan et al., 2022; Li et al., 2022; Usman et al., 2021; Wang et al., 2022). Renewable energy also increases economic growth through the creation of new economic opportunities. The results of this analysis are as expressed in research conducted by (Fan & Hao, 2020). Investments in renewable energy such as solar, wind, and biomass can reduce dependence on fossil fuels. Renewable energy also improves economic efficiency by reducing long-term operational costs. Unlike fossil fuels whose prices tend to fluctuate and are vulnerable to global market crises, renewable energy offers a stable and more economical source of power in the long run. The declining cost of technologies, such as solar panels and wind turbines, also makes renewable energy more competitive in the market. These efficiencies enable better resource allocation, boost industrial productivity, and open up new investment opportunities that contribute to sustainable economic growth (Zahoor et al., 2022).

**Environmental Impact of Renewable Energy to Strengthen Economic Stability**

In addition to impacting the national economy, the transition to renewable energy has a positive impact on the environment, which in turn strengthens economic stability. This is

as stated by research conducted by (I. Khan et al., 2022; Li et al., 2022; Mohsin et al., 2021; Zahoor et al., 2022). Reducing carbon emissions and air pollution helps mitigate climate change (Azam et al., 2021). Switching to renewable energy will reduce environmental degradation and thus improve environmental performance. Thus, renewable energy is not only a sustainable energy solution but also a catalyst for creating a healthier and more stable economy.

Renewable energy also has an important role in supporting the transition to a green economy by providing sustainable and environmentally friendly energy solutions. This is as expressed in research conducted by (Fang et al., 2022; Zhao et al., 2022). The use of renewable energy, such as solar, wind, and biomass, helps reduce dependence on fossil fuels that produce high carbon emissions, thereby reducing negative impacts on the environment. In addition, investments in renewable energy drive clean technology innovation, create green jobs and improve energy efficiency across different sectors of the economy. By supporting cleaner production and consumption, renewable energy accelerates the achievement of sustainable development, improves people's quality of life, and ensures a balance between economic growth and environmental preservation. This makes renewable energy a key foundation in building an inclusive and resilient green economy for the future.

**Impact of Renewable Energy on Exports**

Renewable energy also has a significant role in improving export quality and promoting sustainable economic growth. This is as stated by research results by (S. A. R. Khan, Zhang, et al., 2020). By developing renewable energy, countries can produce more environmentally friendly products, which are increasingly in demand in the global market as awareness of sustainability increases. Products produced using clean energy often meet international environmental standards, such as low-carbon or green energy certifications, which provide added value in international trade. This not only strengthens export competitiveness but also expands market access, especially to developing countries that implement strict policies regarding the carbon footprint of their imported products. In this way, renewable energy contributes to the improvement of the country's trade balance and export diversification.

**Conclusion:**

The conclusion of this article is that renewable energy policies have a significant impact on national economies, especially in supporting the transformation towards a green economy. Renewable energy contributes to economic growth by creating new investment opportunities, increasing energy efficiency, and reducing dependence on fossil fuels. In addition, renewable energy encourages exports of environmentally friendly products that meet international standards, increasing competitiveness in the global market.

The transition to renewable energy also strengthens economic stability through carbon emission reduction and climate change mitigation. However, there are challenges such as high investment costs and inadequate infrastructure, which require synergy between the government, private sector, and communities. With a holistic approach, renewable energy is not only a clean energy solution, but also a key pillar in realizing an inclusive, sustainable, and resilient green economy in the future.

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