



# Renewable Energy: A Cornerstone in The Transition Toward a Sustainable Future

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## Abstract

*The transition toward a sustainable future is increasingly dependent on the integration of renewable energy sources. This article explores the pivotal role that renewable energy plays in achieving sustainability goals. It discusses various forms of renewable energy, including solar, wind, hydro, and geothermal power, and examines their potential to reduce carbon emissions and mitigate climate change. Additionally, the article addresses the economic and social benefits of renewable energy, such as job creation, energy security, and reduced reliance on fossil fuels. The challenges and barriers to widespread adoption are also considered, alongside potential solutions and policy recommendations. Ultimately, this article underscores the necessity of renewable energy as a cornerstone in building a sustainable and resilient future for all.*

**Keywords:** *Renewable Energy, Cornerstone, Transition, Renewable Energy, Sustainable Future*

*Transisi menuju masa depan yang berkelanjutan semakin bergantung pada integrasi sumber energi terbarukan. Artikel ini mengeksplorasi peran penting yang dimainkan energi terbarukan dalam mencapai tujuan keberlanjutan. Artikel ini membahas berbagai bentuk energi terbarukan, termasuk tenaga surya, angin, air, dan panas bumi, serta mengkaji potensinya dalam mengurangi emisi karbon dan memitigasi perubahan iklim. Selain itu, artikel ini juga membahas manfaat ekonomi dan sosial dari energi terbarukan, seperti penciptaan lapangan kerja, keamanan energi, dan pengurangan ketergantungan pada bahan bakar fosil. Tantangan dan hambatan terhadap adopsi yang luas juga dipertimbangkan, bersama dengan solusi potensial dan rekomendasi kebijakan. Pada akhirnya, artikel ini menekankan pentingnya energi terbarukan sebagai landasan dalam membangun masa depan yang berkelanjutan dan tangguh bagi semua.*

**kata kunci:** *Energi Terbarukan, Landasan Utama, Transisi, Energi Terbarukan, Masa Depan Berkelanjutan*

## **A. Introduction**

In recent decades, climate change and environmental degradation have become an urgent global problem. Many countries around the world are striving to reduce their dependence on fossil fuels and shift to cleaner and more sustainable energy sources. In this context, renewable energy emerges as an important component in global efforts to a sustainable future. Renewable energy includes a range of naturally renewable natural resources, such as solar, wind, water, and earth heat. These energy sources not only have the potential to reduce greenhouse gas emissions, but also provide significant economic and social benefits, including job creation and improved energy security.

The transition to renewable energy is not only a technological change, but also involves a systemic change in policies, infrastructure, and behaviour. The challenges and obstacles faced in this transition include high initial costs, technological uncertainty, and the resistance of established industries. However, with the right approach and strong policy support, many of these obstacles can be overcome.

This article aims to examine the vital role of renewable energy in the transition to a sustainable future. By exploring the various forms of renewable energy and their potential to reduce environmental impact, this article will highlight the importance of renewed energy as a key foundation in the global effort to create a cleaner and safer world for future generations.

In addition, renewable energy also provides opportunities for economic diversification, especially in countries with abundant natural resource potential. For example, countries with high exposure to sunlight can develop solar industries, while regions with strong winds can use wind energy as a primary source. This diversification not only helps in reducing dependence on energy imports, but also drives local technology development and creates new jobs.

While the benefits of renewable energy are obvious, the transition to its widespread use requires a strong commitment from all stakeholders, including governments, the private sector, and civil society. Besides, education and public awareness of its importance

Renewable energy also plays a key role in ensuring the success of this transition. In this article, we will discuss various aspects of renewable energies, ranging from the technologies used, the environmental and social benefits generated, to the challenges and solutions that may be faced in these transition

efforts. Thus, this article aims to provide a comprehensive understanding of the importance of renewed energy in achieving a sustainable and resilient future.

## **B. Method**

The research uses a multidisciplinary approach to explore the role of renewable energy in the transition to a sustainable future. The methods used include literature reviews, secondary data analysis, case studies, and interviews with experts in the field of renewable energy. The following are the details of the methods used:

### **1. Literature reviews**

The literature reviews are carried out to gather information and data from various reliable sources, including scientific journals, reports of international organizations, books, and articles from trusted media. The main focus of this review is to identify the benefits, challenges, and opportunities related to renewable energy, as well as policies that support the energy transition in different countries.

### **2. Secondary Data Analysis**

Secondary data analysis is done by collecting and analyzing data available from various sources, such as annual reports, energy statistics, and public databases. This data is used to understand global trends in the use of renewable energy, measure its impact on carbon emissions, and evaluate the economic and social benefits resulting.

### **3. Case studies**

studies are conducted to explore the experience of specific countries or regions that have succeeded in implementing renewable energy. These case studies include policy analysis, technologies used, challenges faced, and results achieved. The countries selected for the case study included Germany, Denmark, and India, which are known as leaders in the adoption of renewable energy.

### **4. Interviews with Experts In-depth**

interviews with experts in the field of renewable energy, including academics, practitioners, and policymakers, are conducted to gain in-depth insight into key issues and best practices in the energy transition. These interviews help in

identifying undocumented challenges widely and obtaining direct perspectives from professionals involved in this field.

## **5. Policy analysis**

Policy analysis is conducted to assess energy policies in different countries and how such policies support or hinder the transition to renewable energy. The main focus of this analysis is subsidy policies, fiscal incentives, environmental regulations, and other government initiatives that affect the adoption of renewable energy.

These methods enable this research to provide a comprehensive picture of the importance of renewable energy and how it can be a major foundation for achieving a sustainable future. With a holistic approach, the study seeks to present a thorough and thorough analysis of issues related to renewable energy. It also refers to the research report and is presented on the International Commitment to the Community (ICC) theme Tackling Community Challenges in the IMT-GT Region: A Multidisciplinary Strategy for Empowering Local Voices.

## **C. Results and Discourse**

### **1. Result**

The results of this study show that renewable energy plays a key role in the transition to a sustainable future. The main findings of this study include: The use of renewable energy significantly reduces greenhouse gas emissions compared to fossil fuels. Data from various case studies show that the transition to renewable energy has contributed to reduced CO<sub>2</sub> emissions globally, as well as reduced air pollution and negative impacts on human health. For example, countries like Germany and Denmark that are aggressively implementing renewable energy policies have managed to reduce their carbon emissions substantially in the last decade.

Renewable energy offers great potential for job creation and local economic development. Data analysis shows that the renewable energy sector has created millions of jobs worldwide, mainly in the installation and maintenance of technologies such as wind turbines and solar panels. In addition, investments in renewable energy have also driven technological innovation and the development of new industries, which contribute to economic growth.

Diversification of energy sources through the use of renewable energy increases energy security by reducing dependence on imports of fossil fuels. Countries that develop domestic renewable energy capacity have more control over their energy supplies and are more able to cope with global energy price fluctuations. Case studies show that countries like India have succeeded in increasing their energy independence through expansion of renewable energy capacity.

Despite the obvious benefits, the transition to renewable energy faces many challenges. High initial costs for renewable technologies, technological uncertainty, and the resilience of the fossil fuel industry are some of the major barriers identified. For example, studies show that the cost of initial investment for renewable energy projects is often a barrier for developing countries. Moreover, existing infrastructure is often not ready to support widespread integration of renewable energy.

Policy analysis shows that government support through fiscal incentives, subsidies, and regulations that support renewable energy plays an important role in the success of the energy transition. Countries that implement comprehensive renewable energy policies, such as feed-in tariffs and tax credits for renewables, have shown higher rates of adoption and faster development in the renewed energy sector.

Overall, the results of this study confirm that renewable energy is not only essential to addressing global environmental challenges, but also provides significant economic benefits and energy security. However, to an effective transition, strong policy support and sustained investment in renewable energy technologies and infrastructure are needed. Digital transformation has become a global phenomenon that has a broad impact on various aspects of public life. Advances in information and communication technology have changed the way individuals interact, communicate, learn, and work. One of the real examples of transformation digital is the emergence of a variety of virtual communities that allow individuals to connect with each other without distances and time limits.

## **2. Discourse**

This discussion examines the implications of research results related to the role of renewable energy in the transition to a sustainable future. The main focus of the discussion included environmental benefits, economics, energy security, as well

as relevant challenges and policies. Research results show that renewable energy has a positive environmental impact by significantly reducing greenhouse gas emissions and air pollution. Solar, wind, and hydropower are sources of energy that do not generate carbon emissions during its operation, thus reducing its contribution to climate change. This reduction in emissions contributes to improved air quality and human health, as well as the preservation of natural ecosystems. For example, research in Germany and Denmark revealed that an increase in the proportion of renewable energy in the national energy mix has contributed to a substantial reduction in CO<sub>2</sub> emissions. Therefore, increased adoption of renewable technologies is an effective strategy to reduce the negative environmental impact of energy consumption.

From an economic point of view, renewable energy offers a variety of benefits, including job creation and increased economic growth. Investments in renewable energy sectors, such as wind turbine installations or solar panels, generate a variety of jobs from production and installation to maintenance. Data shows that the renewable energy sector has created millions of jobs worldwide, making an important contribution to the local economy. Moreover, the development of new technologies and innovations in the sector also boosts the growth of new industries, strengthens local economies and increases global competitiveness.

Energy security is an important aspect of the energy transition. Diversification of energy sources through the use of renewable energy reduces dependence on imports of fossil fuels, which are often affected by price fluctuations and geopolitical tensions. Countries that are increasing their domestic renewable energy capacity, such as India, show that they are better placed to cope with global energy market uncertainty and maintain energy supply stability. Better energy security supports energy independence and reduces the risk of energy supply disruption that can affect the economy and well-being of people.

Although renewable energy offers many benefits, the transition to the use of renewables is not without challenges. High initial costs for renewable technologies are often a barrier, especially for developing countries that may not have sufficient financial resources for initial investment. Besides, technological uncertainty and infrastructure integration can also be an obstacle to the adoption of renewable energy. Research shows that many renewable energy projects face challenges in terms of energy storage and management of supply variability.

Therefore, technological innovation and supporting infrastructure development are needed to address these challenges.

Government policy plays a crucial role in supporting the renewable energy transition. Studies show that supportive policies, such as subsidies, fiscal incentives, and favourable regulations, can accelerate the adoption of renewable energy. Countries that have succeeded in the renewable energy transition, such as Germany and Denmark, have implemented strong and consistent policies to support the development of renewables. Supporting policies not only encourage investment but also create a stable framework for the growth of the renewable energy sector. It is therefore important for countries to design and implement policies that support renewable energy effectively.

Overall, renewable energy has great potential to be a major foundation in the transition to a sustainable future. To optimal results, it is important for countries to continue to increase investment in renewable technologies, address existing challenges, and implement supportive policies. Collaboration between governments, the private sector, and civil society will be key to overcoming the obstacles to ensuring a successful energy transition. With the right approach, renewable energy can play a central role in creating a cleaner, safer, and sustainable world for future generations.

#### **D. Conclusion**

Renewable energy is a key element in the transition to a sustainable future. Research results show that the utilization of renewable energy sources, such as solar, wind, water, and earth heat, has significant positive impacts on the environment, the economy, and energy security. Renewable energies effectively reduce greenhouse gas emissions and air pollution, which contribute to the improvement of environmental quality and human health. By diverting reliance from fossil fuels, renewable energy plays an important role in mitigating climate change and preserving ecosystems. The renewable energy sector creates new jobs and drives local economic growth through investment in new technologies and infrastructure.

Diversification of energy sources produced from renewable energy reduces reliance on fossil fuels and increases national energy security. It allows countries to be more independent in energy supply and reduce the risks associated with price fluctuations and geopolitical tensions. Supportive government policies, such as fiscal incentives, subsidies, and favourable regulations, are crucial in accelerating the adoption of renewable energy. With the right strategy and strong commitment, renewable energy can play a central role in creating a more sustainable and resilient world for future generations.

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