

## ANALYSIS OF THE APPLICATION OF SUSTAINABLE ECONOMY TO FOSSIL ENERGY CONSUMPTION TO THE ENVIRONMENT

Nurmayani Istiningsih <sup>1\*</sup> Zulkifli Zainuddin <sup>2</sup>

<sup>1-2</sup> STIE GANESHA

Email: <sup>1</sup> [nurmayaniisti@gmail.com](mailto:nurmayaniisti@gmail.com)

<sup>\*</sup> Corresponding Author

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### **Abstract**

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The number of the world's population continues to increase every year in line with the increasing rate of economic growth, the rate of population growth, and the rapid development of the industrial sector. So that an increase in energy demand is inevitable. Human energy needs are obtained from the conversion of fossil energy sources, either directly or indirectly, which can have a negative impact on the environment and the health of living things and inefficiencies. The burning of fossil energy sources causes air pollution (acid rain, smog and global warming) where acid rain causes soil and waters (lakes and rivers) to become acidic. For agriculture and forests, the acidity of the soil will affect the growth of crop production. In the waters, acid rain will cause disturbances for living things in it. So that the number of human activities in increasing economic growth becomes more and has an impact on the environment, especially in the use of energy sources for the needs of households, industries and so on with the increasing use of fossil energy causing various problems, especially for the environment which uses a lot of fossil energy. This study generally aims to (1) Determine the form of implementation of sustainable development policies (2) Factors that inhibit and support the implementation of sustainable development policies. This research was conducted with descriptive qualitative research. Where in this study using triangulation using an inductive method, the results of qualitative research emphasize more on meaning than generalization. With the results of the study, fossil energy consumption has a big impact on the environment, especially through greenhouse gas (GHG) emissions. Sustainable economics emphasizes the importance of meeting today's needs without sacrificing the capabilities of future generations. And with public awareness of the impact of fossil energy consumption is critical in the transition to a sustainable economy. And although there are many opportunities, there are several challenges that need to be faced in implementing a sustainable economy on fossil energy consumption. So the researcher suggested increasing education and awareness and bureaucratic reform.

### **Keywords:**

Fossils, Development Policy, Ecological Sustainability, Social, Economic and Institutional.

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## INTRODUCTION

The number of the world's population continues to increase every year, this increase is in line with the increasing rate of economic growth, the rate of population growth, and the rapid development of the industrial sector. So that an increase in energy demand is inevitable. Currently, almost all human energy needs are obtained from the conversion of fossil energy sources either directly or indirectly which can have a negative impact on the environment and the health of living things as well as inefficiencies in transportation facilities and an industry, in addition to household activities and forest fires.

The results of research in several big cities such as Jakarta, Bandung, Semarang and Surabaya show that motor vehicles are the main source of air pollution. In general, the exploitation and use of natural energy sources to meet human needs will always have a negative impact on the environment.

In addition to producing energy, the burning of fossil energy sources (e.g., petroleum, coal) also releases gases, including carbon dioxide ( $\text{CO}_2$ ), nitrogen oxides ( $\text{NO}_x$ ), and sulfur dioxide ( $\text{SO}_2$ ) which cause air pollution (acid rain, smog and global warming) where acid rain causes soil and waters (lakes and rivers) to become acidic. For agriculture and forests, the acidity of the soil will affect the growth of crop production. In the waters, acid rain will cause disturbances for living things in it. In addition, acid rain directly causes damage to buildings (rust and weathering) and petroleum exploitation, especially improper ways of storing and transporting petroleum, for example: leaking oil tanks or other accidents will result in oil spills (into the sea, rivers or groundwater) can cause water pollution.

This human activity is more interpreted as encouraging the community's economy where one of the efforts to improve welfare can realize high economic growth and can encourage the progress of a region because regional or state financing is sourced from high economic growth (Alisman, 2018).

So that the number of human activities to increase economic growth becomes more and has an impact on the environment, especially in the use of energy sources for the needs of households, industries and so on with the increasing use of fossil energy causing various problems, especially for the environment which uses a lot of fossil energy.

This is also in accordance with Sasana research (2020) where  $\text{CO}_2$  emissions have a significant influence on government spending in the health sector. Where it is concluded that if the level of  $\text{CO}_2$  emissions in the air increases, then the available air quality will decrease. Low air quality often causes various diseases, especially respiratory diseases that are very dangerous to a person's health. The more often a person is exposed to poor air quality, the greater the chances of getting sick. Therefore, it will increase the demand for healthcare and will ultimately increase government spending in the health sector.

In addition, the use of renewable energy will have an impact in the direction of environmental friendliness. According to research from Allifah et al (2022), it is explained that in the long term, there is a one-way relationship between the impact of hydropower and fossil fuels and the implementation of the green economy in Indonesia.

This study generally aims to (1) Determine the form of implementation of sustainable development policies (2) Factors that inhibit and support the implementation of sustainable development policies.

## 1. Literature Review

### A. Ecological Sustainability

Dimension	Atribute
Ecology	<ol style="list-style-type: none"> <li>1. Land carrying capacity</li> <li>2. Water carrying capacity</li> <li>3. Availability of fishery land</li> <li>4. Opportunities for the entry of anarmonic substances/pollutants into the cultivation environment</li> <li>5. Drought events</li> </ol>

### B. Economic Sustainability

Dimension	Atribute
Economic	<ol style="list-style-type: none"> <li>1. Economy Circulars</li> <li>2. Social justice</li> <li>3. Economic independence</li> <li>4. Innovation and technology</li> </ol>

### C. Economic Sustainability

Dimension	Atribute
Social	<ol style="list-style-type: none"> <li>1. Inclusion</li> <li>2. Responsive to needs</li> <li>3. Community involvement</li> <li>4. Social justice</li> <li>5. Sustainsbility awarenees</li> </ol>

### D. Institutional Sustainability

Dimension	Atribute
Institutional	<ol style="list-style-type: none"> <li>1. Leadership</li> <li>2. Coordination</li> <li>3. Accountability</li> <li>4. Transparency</li> <li>5. Adaptability</li> <li>6. Innovation</li> </ol>

## METHOD

This research was conducted in South Tangerang which is located in East Ciputat. The nature of this research is limited in time due to limited time, which is estimated to start in October 2024 until the researcher gains a truly in-depth understanding of the object being studied, but due to various considerations and limitations of time, cost and energy.

In connection with this research is a type of qualitative research. Qualitative research where the role of the researcher is as a key instrument in collecting data, and interpreting data. Data collection tools usually use direct observation, interviews, document studies. to find out hidden meanings, to understand social interactions, to develop theories, to ascertain the correctness of data and to research the history of development. Bogdan explained that qualitative research methodology is a research procedure that produces descriptive data in the form of written or spoken words from people and observable behaviors.

The validity and reliability of the data using triangulation using the inductive method, the results of qualitative research emphasize more on meaning than generalization. Given that this study aims to understand and interpret various phenomena that exist or that are in reality as a characteristic

of qualitative research, in this case how the process of learning problems from natural society is used, the researcher uses a descriptive qualitative research method.

Bogdan and Biklen stated that the characteristics of qualitative research are: (1) natural, (2) data is descriptive rather than numerical, (3) data analysis is inductive, and (4) meaning is very important in qualitative research.

In this study, data analysis was carried out continuously from the beginning to the end of the study, both in the field and outside the field by using techniques such as those proposed by Miles and Huberman. With the technique of examining the data that has been revealed, it is then discussed with peers, then analyzed by comparing theories from several expert opinions. With the above techniques, it is hoped that the level of trust, distraction, dependency and certainty of data can be presented objectively and can be accounted for.

## **RESEARCH AND DISCUSSION**

### **1. Environmental impact of fossil consumption**

Fossil energy consumption has a major impact on the environment, especially through greenhouse gas (GHG) emissions. Based on interviews with environmental experts, it is known that the burning of coal, oil, and natural gas is the main contributor to CO<sub>2</sub> that causes global warming. For example, data from research shows that the energy sector accounts for more than 70% of global GHG emissions.

#### **1. Air Pollution and Public Health**

Fossil energy consumption also produces harmful pollutants, such as sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>), which negatively impact air quality. Interviews with doctors showed an increase in respiratory disease cases in areas with a concentration of fossil-based power plants. This shows a direct link between fossil energy consumption and public health.

#### **2. Ecosystem Degradation**

The extraction of fossil resources, such as mining and drilling, destroys natural habitats. Case studies in mining areas show severe ecosystem damage, resulting in biodiversity loss. The researchers note that endangered species are decreasing due to this activity.

### **1. Economic principles of sustainability in energy**

Sustainable economics emphasizes the importance of meeting today's needs without sacrificing the capabilities of future generations. In the context of fossil energy, some of the key principles include:

#### **1. Diversification of energy sources**

Interviews with energy experts revealed that diversification of energy sources, including the development of renewable energy such as solar, wind, and bioenergy, is essential. Countries investing in renewable energy are showing a decrease in dependence on fossils.

#### **2. Technological Innovation**

The development of cleaner and more efficient technologies is very important. Research shows that carbon capture and storage (CCS) technology can help reduce emissions from fossil-based power plants. However, many experts note that the adoption of this technology is still slow, especially in developing countries due to high costs.

#### **3. Regulations and policies**

Government policies play a key role in encouraging the implementation of a sustainable economy. Interviews with policymakers show that incentives for renewable energy and carbon taxes can influence investment decisions. However, regulatory challenges often arise, such as political interests and lobbying from the fossil energy industry.

#### A. Community Engagement and Education

Public awareness of the impact of fossil energy consumption is essential in the transition to a sustainable economy.

##### 1. Public awareness and education

1. Through interviews with community members, it was found that educational programs focused on sustainability and environmental impact can increase public knowledge and support. Examples of awareness campaigns in several countries show increased public participation in energy-related decision-making.

##### 2. Community participation in energy projects

Community-based renewable energy projects have proven effective in increasing community engagement. Case studies show that when people are involved in renewable energy projects, they are more committed to maintaining the sustainability of the project. This creates a sense of belonging and responsibility towards the environment.

#### B. Challenges and Obstacles in Implementation

Despite the many opportunities, there are several challenges that need to be faced in implementing a sustainable economy on fossil energy consumption:

##### 1. Resource limitations

In many countries, especially in the developing world, limited financial and technological resources are a major barrier to switching away from fossil energy. Interviews with local leaders revealed an urgent need for international support in the form of funding and technology transfer.

##### 1. Changes in consumption patterns

Changes in people's energy consumption behavior are also a challenge. Many people still rely on fossil energy due to its lower cost and availability. Effective education and campaigns are needed to change these consumption patterns.

##### 2. Fossil energy industry lobby

Lobbying from the fossil energy industry often hinders policies that support renewable energy. Experts state that there is a need to encourage transparency and accountability in energy policy to mitigate these negative influences.

## CONCLUSION

Research shows that the implementation of sustainable development policies is carried out through various programs and projects involving stakeholders, both the government, the community, and the private sector. The participatory process in policy formulation is key in ensuring relevance and successful implementation. Key supporting factors in the implementation of sustainable development policies include: a) Strong political commitment: Support from governments and local leaders is essential for resource allocation. B) Community involvement: The active participation of the community in the decision-making process increases the legitimacy and success of the policy. C) Financial and technological resources: Adequate investment and access to the right technology support policy effectiveness. There are several challenges in

implementation, including: Lack of awareness and knowledge: Minimal education on sustainable development hinders community engagement, Complicated bureaucracy: Slow licensing processes and overlapping regulations are often obstacles. Short-term economic interests: Prioritizing short-term economic gains often overlooks sustainability. The suggestions given are 1) Increasing Education and Awareness. Educational programs and awareness campaigns on the importance of sustainable development should be expanded. This can include workshops, seminars, and educational programs in schools to improve public understanding. 2) Bureaucratic Reform. The bureaucratic process needs to be simplified to accelerate decision-making related to sustainable policies. This can be done by reducing the number of overlapping regulations and increasing transparency in the licensing process. 3) Strengthening stakeholder involvement. Increasing collaboration between the government, the private sector, and the community in policy formulation and implementation. Public discussion and consultation forums can be used to ensure that all voices are heard and considered. 4) Support for Innovation and Technology. Encourage investment in innovation and technology that supports sustainability. The government can provide incentives for companies that develop green solutions and promote renewable energy.

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