

## Villages Owned Enterprise Provide Solutions to Leader's Addictionability of Energy Crisis

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### **Abstract**

*The Energy Crisis will soon confront at the beginning of the 21st Century and now is the transition period from Fossil Energy to New and Renewable Energy. This century has again seen a transportation revolution as at the beginning of the industrial revolution, everywhere humans are competing to manufacture propulsion sources derived from Solar Cells, Hydrogen Water, Wind Power, Tidal Wave Movement, Geothermal Energy and Synthetic Coal from Botanicals, so that a shift in Fossil Energy is slowly disappearing from the earth's surface. This research was conducted at Village-Owned Enterprises and is expected to be able to provide solutions in the Energy Transition, the Government's Commitment, which is supported by the influence of the Energy Crisis Policy in Indonesia. Energy Crisis Independence Indonesia has 3.6 billion barrels with a constant average of 800,000 barrels per day as future energy reserves, while these reserves will most likely no longer be able to be produced to meet needs in the next 12 years. This imbalance requires the performance policy, competence and commitment of government leaders to create the role of the private sector from rural to urban areas in bonds and EBT shares on stock exchanges by villages enterprise with a level of security and assurance as well as green energy with household waste as a raw material for Home-trash to Green-tech New-energy (MHGNe) Manufacturing technology which is the only closest alternative currently on earth.*

**Keywords:** Gov-Commitment, Performance Policy, Energy Crisis, Employee Competence, Villages Owned-Enterprise.

### **INTRODUCTION**

Since the Industrial Revolution 2.0 in 1870-1914 after the First World War was the first milestone as the Manufacturing Revolution until the Second World War in 1945-1949. At that time, these two momentums were the beginning of turmoil. Without realizing it, the energy crisis had started three centuries ago. At the 2023 ASEAN Summit, according to Riyandanu (2023)<sup>3</sup> that there are 10 countries with the world's largest oil reserves that the USA since 2021 has produced crude oil of 16.59 million barrels per day (bpd), Saudi Arabia has reached 10.94 million bpd, while the USA's oil reserves are only 68.76 billion barrels compared to Saudi Arabia which has reserves reaching 297.53 billion barrels. Followed by Venezuela in this Latin American country, it has reserves of 303.81 billion barrels which in 2021 will reach 654 thousand bpd. Besides that, the conditions of the economic crisis, corruption and sanctions from the USA hinder the Venezuelan Government from optimizing its extraordinary oil wealth. Furthermore, Canada has oil production of 5.43 million bpd in 2021, Iran still has reserves of 157.8 billion barrels with production of 3.62 million bpd. The Iraqi state with reserves of 145.02 billion barrels with a production of 4.10 million bpd. The Russian state still has reserves of 107.8 billion barrels with a production of 10.94 million bpd.

As for other Emirati countries, such as Kuwait, they have 101.5 billion barrels with an average production of 2.74 million bpd and are still able to export 1.7 million bpd. The UAE as a member of OPEC has reserves of 97.8 billion barrels with an average production of 3.67 million bpd and is capable of exporting 2.3 million bpd. Libya, which is located in North Africa, has crude oil reserves of 48.36 billion barrels with an average production of 1.27 million bpd. Political instability and power struggles between factions and several economic upheavals as well as leadership crises can result in disruptions to world oil production as the only source of fossil energy which will end soon in the green century we are currently facing.

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Ministry of Energy and Mineral Resources, Arcandra Tahar (2017)<sup>2</sup> said in a meeting that Indonesia is currently estimated to have oil reserves of 3.6 billion barrels. If with an average production of 800,000 barrels per day and without doing anything, it is estimated that Indonesia will no longer be able to produce oil in 12 years. To anticipate this, several steps can be taken in the short, long and medium term so that within 12 years Indonesia will still be able to produce petroleum. Airlangga (2023)<sup>1</sup>, The energy transition that is being carried out by Indonesia is one of the efforts to maintain energy security and realize a green economy in Indonesia. During the G20 Presidency event last year, the Government also produced a number of financing and investment collaborations in the energy sector. This can be seen from the collaboration between Partnership for Global Infrastructure and Investment, Asia Zero Emission Community (AZEC), Just Energy Transition Partnership (JETP), and Millennium Challenge Corporation (MCC) Compact.

The Energy Crisis will soon confront at the beginning of the 21st Century and now is the transition period from Fossil Energy to New and Renewable Energy, especially when this is happening again. The transportation revolution, as at the beginning of the industrial revolution, humans are competing to manufacture propulsion sources from Solar Cells, Hydrogen Water, Wind Power, Tidal Movement, Geothermal Energy and Synthetic Coal from Botanicals, so that a shift in Fossil Energy is slowly disappearing from the earth's surface. Seeing this powerful phenomenon, one can imagine the wave of the 21st Century Energy Revolution movement which is inseparable from the Role of Leaders and Leadership Styles of every organization and head of state to regulate and control and create new and renewable energy sources to maintain the foundations of people's lives. Energy never disappears from Earth, it only changes to another form, all of that can be explored again and depends on how humans find and manage it.

## **LITERATURE REVIEW**

### **Government Commitment (X<sub>1</sub>)**

Since 2015, the Indonesian government has committed and is involved in various national and international activities in the clean energy transition program, renewable energy towards carbon-free by 2050. According to Airlangga (2023)<sup>1</sup>, the government's commitment is an effort by the government as the leader of a country in an energy transition to anticipate future energy crises and the government to increase the mix of New Renewable Energy (EBT) sources. Some of the things the government has done include holding national and international meetings to discuss the Energy Crisis as well as the government's concern and commitment in this regard.

Fu, J., & Ng, AW (2021)<sup>11</sup>, Policy Implementation on determining a portfolio of plans for exploration of fossil and non-fossil energy sources in the short, medium and long term. In order to increase EBT assets, it is hoped that the government can issue Green Bonds through a Structured Public-Private Collaboration to manage risks in developing economies and alternative energy. The government's commitment to cooperation and courage in making decisions to issue stocks and bonds is the beginning of a commitment to create alternative energy besides fossil energy. The involvement of Private Financial Institutions and other Semi-Government Institutions in the non-banking financial sector needs attention and involvement, such as Cooperatives, BMT, BUMDes, Mosque-Owned Enterprises, BAZ and Other Micro Enterprises as well as Educational Institutions from the PAUD, SD, SLTP, SLTA and Higher Education levels.

Nissa *et.al* (2022)<sup>13</sup> that in Surabaya Mayor Regulation Number 1 of 2019 Concerning Saving the Use of Electricity and Water Energy in the Surabaya City Government Environment Instructs Heads of Regional Apparatuses in the Surabaya City Government Environment and Heads of Technical implementation units in Regional apparatuses in the Government Environment City of Surabaya, to take steps and innovations to save electricity and water in their respective environments according to the authority intended for lighting, office equipment, equipment and other equipment that uses electrical energy for their utilization, for office buildings and/or buildings in their respective environments -respectively. And don't forget to collaborate with 11 agencies in implementing it in office areas as a process of supporting the role of the Environmental Service in continuing to campaign for energy saving. Governace needs some indicators likes change's environment, people needs, equipment campanye, budget.

Sribna *et.al* (2019)<sup>20</sup>, an analysis of the sustainable development of energy policies in Bangladesh are needed to be evaluated to make the existing energy sector more production, forecasting, implementation dan sustainable. Many developing countries have made predictions from production planning, use to assessing the results of work feedback, plans, checks and evaluations for the sustainability of energy for the benefit of their communities.

**Tabel 1. of Variabel Gov-Commitment**

| No | Theory                                   | Dimension             | Indicator  |
|----|--|-----------------------|--|
| 1  | Airlangga (2023) <sup>1</sup>            | Gov-Commitment        | Energy transition, renewable energy, holding national, international discuss   |
| 2  | Fu, J., & Ng, AW (2021) <sup>11</sup>    | Implementation Policy | Private Financial Institutions, Semi-Government Institutions, Villages Owned Enterprise(BUMDes), Other Micro Enterprises |
| 3  | Nissa <i>et.al</i> (2022) <sup>15</sup>  | Gov-Regulator         | Changes environment, people needs, equipment campanye, budget  |
| 4  | Sribna <i>et.al</i> (2019) <sup>20</sup> | Policy energy         | Production, forecasting, implementation, sustainable   |

**Performance Policy (X<sub>2</sub>)**

Based on data (2014)<sup>4</sup> obtained in Canada, which is also one of the world's oil-producing countries, this country is carrying out an energy transition by diversifying and establishing an energy portfolio which is a government policy and program including the first seven policies Energy Efficiency, namely by carrying out increasing energy savings such as the transportation sector prioritizes the convenience and comfort of public transportation that is cheap and easy to reach rather than owning a private vehicle. The public facilities include trains, buses or city trams, cable car crossings and airplanes.

Joseph R. DesJardins. (2022)<sup>21</sup> Technology Development of Nuclear is the second choice in etical and moral aspect of energy using efficiency which is the cheapest option but has concerns about a high level of risk if a leak occurs, however in the CANDU policy for the country which is located in the north of the Americas it insists on carrying out its largest uranium production policy as the development of a nuclear reactor. The third option to replace Fossil Oils is Crude Oil which is produced from Plant Oils such as Palm Oil, Coconut, Corn, Soybeans, Cotton Seeds, Castor Seeds and other types of Plants that can secrete Oil.

Hazboun S, Boudet H (2020)<sup>22</sup>, In the fourth policy, namely by utilizing Natural Gas and Geothermal whose reserves are known to be inexhaustible so that this fourth reserve is energy that can bring in foreign exchange, meaning that export trade can be carried out to neighboring countries that need it, even Canada can produce 7.28 billion dollars annually. In this fifth, policy it is said to be an Energy Technology Innovation which requires Research and Development investment in science so that in this policy a lot of funding is spent. In Canada, the costs incurred were 3 billion Canadian dollars which were able to employ 274,000 research experts and workers to obtain new formulations, discoveries of clean, environmentally friendly technologies, climate crisis, economy predictors

Özbay R *et.al* (2022)<sup>23</sup>, in utilizing policy periode between 1985 and 2018 is Hydroelectricity in China which will be able to produce electricity from turbines created from dams or even rivers that flow swiftly made attenuation and large embankments so that it requires a one-time investment to make it quite large but this work still has risks in control of water discharge which depends on rainfall and requires extra tight supervision with an automation system. This does not rule out the possibility of flooding in low-lying areas due to the overflow of water from the higher plains hills.

Finally, the seventh performance policy is that Renewable Energy is a new answer and challenge in the last five years to create a power capacity of air into air-powered electricity, however, the excess of Wind Power Energy has a capacity of 5.4 greater than solar power.

**Tabel 2. of Variabel Performance Policy**

| No | Theory                                     | Dimension              | Indicator  |
|----|--|------------------------|--|
| 1  | Based on data (2014) <sup>4</sup>          | Energy protfolio       | Trains, city trams, cable car crossings , airplanes.                       |
| 2  | Joseph R. DesJardins. (2022) <sup>21</sup> | Technology Development | Palm Oil, Coconut, Corn, Soybeans.   |
| 3  | Hazboun S, Boudet H (2020) <sup>22</sup>   | Inexhaustible Energy   | new formulations, discoveries of clean, climate crisis, economy predictors |

|   |   |                    |  |
|---|---|--------------------|--|
| 4 | Özbay R <i>et.al</i> (2022) <sup>23</sup> | Economic Expansion | Emissions, urbanization, GDP, globalization. |
|---|---|--------------------|--|

### Energy Crisis (Y)

The Energy Crisis is a condition where energy reserves are not balanced with the condition of the needs of the community. According to Arcandra (2017)<sup>2</sup>, an energy crisis can occur if, in the long term, the government faces an inability to make a replacement value for energy reserves that are adjusted to current needs with exploration efforts to find new reserves. Meanwhile, the Energy Crisis in the medium term can be prevented by increasing oil recovery (IOR). As for the Energy Crisis in the short term, what can be done, among others, is to optimize technologies that can increase production.

The views of third countries on energy saving are in line with research by Raihan *et.al* (2022)<sup>9</sup> Indonesia's energy needs continue to increase along with an increase in population, industry development, the need for security and defense and economic development. But on the other hand, energy as a commodity that is strategic and must always be fulfilled is often constrained in terms of availability (*Addictionability*) especially for fossil energies.

Airlangga & Bratadharma (2023)<sup>18</sup> The government continues to strive to meet this availability, but not without obstacles. The biggest challenge for the government is the balance in the impact of making decisions. The cooperation expected by the government in managing economic diversification during the energy crisis requires a balanced concentration of natural resources, knowledge, technology and innovation. The balance of natural resources is explored through the implementation of energy conservation with the dimensions of energy management, energy performance standards, energy saving labels, financing, development of service businesses, increasing awareness and capacity of human resources, research collaboration and energy conservation, as well as overall optimization.

Bratadharma (2023)<sup>17</sup> pays serious attention to the condition of the energy crisis, the government is committed to maintaining sustainable national energy availability with the only way at this time, namely increasing EBT and setting a target of reducing dependence on fossil energy from 23 percent in 2025 and continuing to increase it to 32 percent in 2050. This is a manifestation of the commitment of The Paris Agreement, for the benefit of the Longterm Strategy for Low Carbon and Climate Resilience 2050. Besides that, the role of the government is not sufficient to realize this program, because the most important object is all aimed at interests the lives of many people so that the community as energy users actually have to care more and fully understand and follow all the energy care guidelines made by the government.

**Tabel 3. of Variabel Energy Crisis**

| No | Theory                                       | Dimension                     | Indicator   |
|----|--|-------------------------------|---|
| 1  | Archandra (2017) <sup>2</sup>                | Increasing Oil Recovery (IOR) | short term, what can be done, among others, optimize technologies             |
| 2  | Raihan <i>et.al</i> (2022) <sup>9</sup>      | Economic Development          | Performance standart, saving labels, service business, research collaboration |
| 3  | Airlangga & Bratadharma (2023) <sup>18</sup> | Coorporation Expected         | Consentration, knowledge, technology, innovation                              |
| 4  | Bratadharma (2023) <sup>17</sup>             | Longterm Strategy             | Programme, coomunity, agreement, benefit.                                     |

### Employee Competence (Z<sub>1</sub>)

The support system is an energy crisis condition that requires backup and saving support from various parties. According to Napis, *et al* (2023)<sup>8</sup> regarding public awareness of energy-saving attitudes and energy resources, especially in household behavior, is very decisive today, determining the result that if the level of public awareness goes up, it will help 10% save national energy. It can be seen that all planned needs in meeting energy needs are returned to household needs so that this has feedback on the support system for every household that has electricity, water, vehicles, communication equipment and other entertainment electronics.

Ilic *et.al* (2019)<sup>12</sup> in the discussion of green economy Financing Government Policy Implementation that efforts to mobilize international capital to finance projects of renewable energy sources with sustainable solutions and investment in decision making and policy for renewable energy projects. Financing that can

provide guarantees for investment and security as well as increases in the price of stocks or bonds that never go down like gold, so that waste is like the equivalent of gold in the form of stocks and waste bank savings.

Young So, P. (2014)<sup>14</sup> that energy conservation is a pillar of national energy management that has not received serious attention in Indonesia. Energy management in Indonesia is prioritized on how to provide energy or expand access to energy for the community. This requires a paradigm shift in energy conservation from supply-side management to demand-side management that focuses on energy conservation in the user sector. The Indonesian government issued a mandatory energy management policy through the establishment of PP no. 70 of 2009 concerning Energy Conservation in 2009. However, since the policy was implemented, Indonesia's energy intensity has actually increased. Important indicators that serve as support systems include economic growth, population, energy prices, environment, communication, resources, disposition, and bureaucratic structure.

Along with public awareness of saving energy, according to Al Bahij *et.al* (2020)<sup>19</sup>, the influence of knowledge and attitudes about saving energy on energy-saving behavior in elementary school students, using a descriptive quantitative research model with a survey approach when there was a population, with a census sampling of 102 students consisting of grades 5A, 5B and 5C. With single regression and multiple regression. shows that there is an influence between energy awareness and energy saving behavior; there is an influence between energy-saving attitudes and *Behavior of Energy-Saving (BES)* on energy-saving behavior of students in Tangerang City.

**Tabel 4. of Variabel Employee Competence**

| No | Theory                                     | Dimension                       | Indicator  |
|----|--|---------------------------------|--|
| 1  | Napis <i>et.al</i> (2023) <sup>8</sup>     | Support system                  | electricity, water, vehicles, communication equipment          |
| 2  | Ilic <i>et.al</i> (2019) <sup>12</sup>     | Financing skill                 | Gold, waste, stock, invesment                                  |
| 3  | Young So,P (2014) <sup>14</sup>            | Management Energy               | Population, energy prices, environment, bureaucratic structure |
| 4  | Al Bahij <i>et.al</i> (2020) <sup>19</sup> | Behavior of Energy-Saving (BES) | Young people, gender, education, area                          |

**Villages Enterprise (Z<sub>2</sub>)**

Heap, B. (2015)<sup>24</sup>, President Truman gave a future picture in 1949 regarding the goals of developing countries in the Millennium Era, that in the next six decades there will be progress and new leaps of knowledge with the transformation of energy, electricity, demand factors and development of rural areas will be eroded by this wave demanding local entrepreneurs to maintain the lives of 1.3 million poor and below standard living people (Holmes and van Gevelt), the new technology is technology based on real financial and energy management on smart villages enterprise.

Schinckus *et.al* (2020)<sup>25</sup>, Schinckus *et.al* (2020)<sup>25</sup>, the need for energy is inevitable for the entire world community so that energy trading through crypto currency and stock prices is one way for the world community to participate in financing and the global economy either in the form of bitcoin or stock prices, however Thus, the scarcity of goods and services will be weighed against the unit price of gold, healthy mineral water, safe and secure stock prices, energy securities, as well as the supply chain supply chain for promising rural business investment, including the basic needs of the world's largest population at the level of poverty in rural areas.

Gurrib, I *et.al* (2022)<sup>26</sup>, the rule discovered by Fibonacci that in the US is that the most dominant indicator in 1500 energy stocks on the market is visible from 2017 to 2020 showing important indicators of profitable change strategies influenced by oil prices, speculators, trading in illegal goods without being protected by law invite, comparison of stock and crypto prices. These four indicators have a strong influence on crypto prices and stock prices globally.

Agur, I. *et.al* (2023)<sup>27</sup>, The energy profile which is the main component and technology choice of digital currency is an answer to the dependence on energy consumption with the findings from the design created, namely a currency payment system, a series of calculations for living needs and a series of measurements of

population growth, which is accompanied by the ability to control the security of the circulation of share sales. or bitcoin digitally.

**Tabel 4. of Variabel Villages Enterprise**

| No | Theory                                      | Dimension                 | Indicator   |
|----|---|---------------------------|---|
| 1  | Heap, B. (2015) <sup>24</sup>               | Smart Villages Enterprise | transformation of energy, electricity, demand factors, development of rural areas   |
| 2  | Schinckus <i>et.al</i> (2020) <sup>25</sup> | Crypto Currency Energy    | Gold, waste, stock, investment  |
| 3  | Gurrib, I <i>et.al</i> (2022) <sup>26</sup> | Rule of Fibonacci         | oil prices, speculators, trading in illegal goods without being protected by law invite, comparison of stock and crypto prices. |
| 4  | Agur, I. <i>et.al</i> (2023) <sup>27</sup>  | Security of Stock         | Payment system, algoritma consumption, ability of control, digitalisasi securitas.  |

## METHODOLOGY

Moleong, LJ (2007)<sup>10</sup>, Literature Study The research conducted in this study provides answers to several of the variables in this article. Then, laying out the basic research framework in  $Y = \alpha + (\beta_1X_1 + \beta_2X_2) + Z + e$ , which can be detailed in the statement of the research variables in the hypothesis, namely the influence of government commitment and the energy transition to the energy crisis through a support system. The answers to the results of the research and analysis are in the form of a qualitative descriptive which explains the results of the discussion and solutions to the analysis of the problems encountered. The novelty that is expected in this study is the role of the government's commitment in adopting an energy transition policy which is supported by a support system to overcome the current energy crisis.

## RESULTS AND ANALYSIS

The government is making efforts with policies in various energy sectors such as biodiesel B35 which has been implemented in early 2022. By utilizing this fuel source, the capacity of EBT power plants has reached 2,576 Megawatts, or it can be said to have increased by 5% in the last five years. However, this effort still needs to be accelerated along with other efforts in the energy transition, such as the transition from coal-fired power plants to non-fossil power plants. In line with Wiyata's research (2021)<sup>15</sup>, the application study in the production of used cooking oil biodiesel by using duck egg shell waste as a CaO catalyst to produce biodiesel from waste vegetable oil is motivated by the fact that the existing energy reserves are decreasing over time.

**Tabel 5. Finding of Variabel Gov-Commitment**

| No | Dimension  | Indicator   | Finding  |
|----|--|---|--|
| 1  | Gov-Commitment, Airlangga (2023) <sup>1</sup>                | Energy transition, renewable energy, holding national, international discuss  | Along, Diyar, S <i>et.al</i> . (2014) <sup>28</sup> Kazakhstan National Strategy Model, sustainable development of green concepts, international programs, renewable resources, green economy and environmentally friendly economy.  |
| 2  | Implementation Policy, Fu, J., & Ng, AW (2021) <sup>11</sup> | Private Financial Institutions, Semi-Government Institutions, Villages Owned Enterprise (BUMDes), Other Micro Enterprises | Supported, Homer-Dixon Thomas (1995) <sup>29</sup> China since the 14th century has been a leader aware of the challenges of population growth rate with rural economic growth, in 1980 to 1994, the infrastructure of roads, waterways, railways and agricultural support has been sufficient for the awakening of opening up to the outside world so that the energy crisis is not a big problem, the rural economy is already strong. |
| 3  | Gov-Regulator, Nissa <i>et.al</i> (2022) <sup>13</sup>       | Changes environment, people needs, equipment campaign, budget   | Conflicting, Binde J (2005) <sup>30</sup> , south-south society is slow to make changes, especially in accelerating the development of global knowledge and technology, thus hampering economic growth and development due to barriers to local & indigenous knowledge, culture, language adjustment, freedom of expression, creativity-innovation, technological breakthroughs and guaranteed access to communication.                  |
| 4  | Policy energy, Sribna <i>et.al</i> (2019) <sup>20</sup>      | Production, forecasting, implementation, sustainable  | Supported, Shtunder, I., <i>et.al</i> . (2022) <sup>31</sup> , the positive impact of the relationship between the global energy crisis and the achievement of sustainable economic development goals, with fluctuating behavior.  |

Furthermore, Wiyata explained that Biodiesel is an alternative fuel, made from petroleum, animal fat, waste oil, and others. Through the process of esterification and transesterification by changing the catalyst concentration of 2% CaO and 4%, working temperature 50° C and 60° C. Operating time is 110 minutes.

The best treatment method for the transesterification reaction, and using a factorial analysis method with 2 level 3 variable design to determine the main effect that has the greatest impact. The best transesterification conditions were the eighth variable, adding 4% CaO (w/w), 130 minutes esterification time and 60° C operating temperature. The biodiesel characteristics obtained were a viscosity value of 3.8246 cSt, a density of 864.8 kg/m<sup>3</sup>, % yield 81.4% and cetane number 38.0. The most influential main effect is the % catalyst.

**Tabel 6. of Variabel Performance Policy**

| No | Dimension  | Indicator  | Finding  |
|----|--|--|--|
| 1  | Energy profolio, Based on data (2014) <sup>4</sup>                 | trains, city trams, cable car crossings, air planes.                       | Along, Hassanien A, Darwis A (2020) <sup>32</sup> , Swarm Intelligence for Resource Management in the Internet of Things presents a new approach in Artificial Intelligence that can be used for resources management in IoT, which is considered a critical issue for this network. The authors demonstrate these resource management applications using swarm intelligence techniques. Currently, IoT can be used in many important applications which include healthcare, smart cities, smart homes, smart hospitals, environment monitoring, and video surveillance. |
| 2  | Technology Development, Joseph R. Desjardins. (2022) <sup>21</sup> | Palm Oil, Coconut, Corn, Soybeans.   | Supported, Seddon, D., (2022) <sup>33</sup> current research and prospects of producing hydrogen using bio, thermal and electrochemical methods and covers hydrogen separation, storage and applications. Hydrogen produced from biomass offers a clean and renewable energy source and a promising energy carrier that will supplement or replace fossil fuels in the future  |
| 3  | Inexhaustible Energy, Hazboun S, Boudet H (2020) <sup>22</sup>     | new formulations, discoveries of clean, climate crisis, economy predictors | Conflicting, Bris, A., et.al (2021) <sup>34</sup> , When energy runs out everyone is confused to find a new formula, but do not think to unite in the form of financial and operational strength, best for mergers and acquisitions of capital and companies then energy solutions can be answered.  |
| 4  | Economic Expansion, Özbay R et.al (2022) <sup>23</sup>             | Emissions, ubanization, GDP, globalization.                                | Supported, OECD (2021) <sup>35</sup> , The government's promise is a hope of the dream, vision, mission, programs carried out, but the support is each experiencing major obstacles from every opportunity, opportunities encountered, every step of the effort until 2050 global carbon dioxide emissions become zero. Until now, the increase in global temperature to 1.5 Celsius has become an inevitable comprehensive figure, the economic symbol is universal energy, the feedback of clean energy is dynamic economic growth.                                    |

The Energy Crisis can be overcome in the Short, Medium and Long Term. As for the ShortTerm Energy Crisis, Technology Optimization is carried out such as Underbalance Drilling, Installation of Artificial Lifts, Submersible Pumps, Fracking which aims to Increase Production. Energy Crisis in the Medium Term can be carried out by Exploration of New Reserves in accordance with the feasibility value of increasing exploration and replacing the value of new reserves. The energy crisis in the long term is by shifting the values of energy reserves from Fossil Energy to Renewable Energy (non-fossil). Based on the results of studies in Canada since 2014, by carrying out a long-term program to make Energy Efficiency policies or Increasing Energy Savings, it has succeeded in reducing exhaust emissions to 90.5 Metric Tons.

**Tabel 7. of Variabel Energy Crisis**

| No | Dimension  | Indicator   | Finding  |
|----|--|---|--|
| 1  | Increasing Oil Recovery (IOR), Archandra (2017) <sup>7</sup> | short term, what can be done, among others, optimize technologies | Conflicting, Martin, M., & Grossmann, I. E. (2011) <sup>36</sup> , Short-term time requires high technology while continuing old programs is long-term already limited in availability, limited renewable resource solutions are a challenge for the Zilenial generation, who conduct transactions and communications via zoom, internet and online. |
| 2  | Economic   | Performance standart, saving                                      | Supported, Roger, I., et.al (2022) <sup>37</sup>   |

|   |  |  |   |
|---|--|--|---|
|   | Development, Raihan <i>et.al</i> (2022) <sup>9</sup>               | labels, service business, research collaboration         | How block-chain technology maintains the security and assurance of product quality, copyright and royalty sustainability of all energy-related products develops variants into collections on sustainable stock exchanges.                              |
| 3 | Cooperation Expected, Airlangga & Bratadharma (2023) <sup>18</sup> | Consentration, knowledge, technology, innovation, energy | Along, Dzwigol, H., <i>et.al</i> (2023) <sup>38</sup> , Europe is ambitiously abandoning coal and mining, greenhouse emissions, renewable energy focus with knowledge, innovation capabilities and effective environmental regulation and transparency. |
| 4 | Longterm Strategy, Bratadharma (2023) <sup>17</sup>                | Programme, coomunity, agreement, benefit.                | Supported, Østergaard, P. A <i>et.al</i> (2022) <sup>39</sup> , with limited oil industry companies in supplying strong encouragement towards the establishment of hydropower plants a key element in efforts to explore renewable energy in Brazil     |

Along with the results of research on EBT, Andriyanto (2021)<sup>5</sup>, that alternative sources of energy raw materials that allow it to be processed into new energy sources, namely the management of organic and non-organic waste which can be used as derivatives into fuel, gas and processing waste can be used as fertilizer while in Indonesia the average person in Indonesia produces 0.68 kg of waste per day, that is, every district and city with a population of 70,000 to 100,000 with a radius of 30 km there is a daily production of 30 metric tons of organic and non-organic waste. This can become a new commitment and policy for leaders to make programs at the DLHKP (Department of the Environment, Sanitation and Gardening and Cemeteries)

**Table 8. of Variabel Employee Competence**

| No | Dimension   | Indicator  | Finding   |
|----|---|--|---|
| 1  | Support system, Napis <i>et.al</i> (2023) <sup>8</sup>                      | electricity, water, vehicles, communication equipment          | Supported, Palmer, W. K. G. (2018) <sup>40</sup> .A safety culture system that recognizes continuous improvement with operational experience of best practices in an atmosphere of organizational learning and communication. |
| 2  | Financing skill, Ilic <i>et.al</i> (2019) <sup>12</sup>                     | Gold, waste, stock, invesment                                  | Yakupoglu, Y. A., & Okur, M. (2021) <sup>41</sup> Gold holds the second ranking after the foreign exchange and real estate holds third  |
| 3  | Management Energy, Young So.,P (2014) <sup>14</sup>                         | Population, energy prices, environment, bureaucratic structure | Ratner, S., <i>et.al</i> (2022) <sup>42</sup> The success of energy efficiency is in the middle of the lowest energy prices   |
| 4  | Behavior of Energy-Saving (BES), Al Bahij <i>et.al</i> (2020) <sup>19</sup> | Young people, gender, education, rural area                    | Irmak, A., <i>et.al</i> (2023) <sup>42</sup> education system plays huge and obvious role in implementation of energy-saving technologies   |

One finding that can be offered when Government policy requires socialization and solutions to financing applications and share ownership as well as bonds with security guarantees and stock exchange trends is Yulianto (2023)<sup>16</sup> BUMDEs resolution performance that has 57,273 BUMDEs, which have certified business legal entities as many as 7,902 BUMDEs. Of the 45,233 BUMDEs that are actively running businesses, they have created jobs for 20,369,834 people with a turnover of IDR 4.6 trillion.

**Table 9. of Variabel Villages Enterprice**

| No | Dimension  | Indicator   | Finding   |
|----|--|---|---|
| 1  | Smart Villages Enterprise, Heap, B. (2015) <sup>24</sup> | transformation of energy, electricity, demand factors, development of rural | Raza, M. Y., <i>et.al</i> (2020) <sup>44</sup> the relationship among fossil fuel energy, clean energy, and population in |



|   |   |   |   |
|---|---|---|---|
|   |   | areas   | rural areas, energy potential, national policies, and international policies.   |
| 2 | Crypto Currency Energy, Schinckus <i>et.al</i> (2020) <sup>25</sup> | Gold, waste, stock, investment  | Giechaskiel, I., <i>et.al</i> (2018) <sup>45</sup> crypto's potential as primitive money is weakened by small private mistakes while the future for energy is very promising.     |
| 3 | Rule of Fibonacci, Gurrib, I <i>et.al</i> (2022) <sup>26</sup>      | oil prices, speculators, trading in illegal goods without being protected by law invite, comparison of stock and crypto prices. | Breman, C., & Storm, S. (2023) <sup>46</sup> oil speculators have to be held accountable for not just raising oil prices, but also driving up food commodity prices.              |
| 4 | Security of Stock, Agur, I. <i>et.al</i> (2023) <sup>27</sup>       | Payment system, algoritma consumption, ability of control, digitalisasi securitas.  | Krukowska, E., & Nardelli, A. (2022) <sup>47</sup> oil price stability devise measures regarding regulated prices that will protect retail consumers and the smallest businesses. |

## CONCLUSION

Energy Crisis Indonesia has 3.6 billion barrels with a constant average rate of 800,000 barrels per day as future energy reserves, while these reserves are no longer possible to produce in the next 12 years.

The Government's commitment to NRE currently is 23% for reserves in 2025 to 31% targeted in 2030. One of the solutions needed at this time is the management of reserves of raw materials for waste which has enormous potential, namely 58 cities/districts contributing the largest national waste pile, including 600 tons of waste per day in Banyumas Regency. Java Island, especially Surabaya contributed 9,185.93 Mtons and Jakarta 6,748.03 Mtons while Semarang contributed 4,917 Mtons per day.

The Energy Transition leading to development that is environmentally sound requires the government to transition to more environmentally friendly energy. On the other hand, environmentally friendly energy, namely New and Renewable Energy (EBT), is still experiencing problems due to high costs, access to costs, high technology, and a legal umbrella that has not been established.

Support systems that must be carried out through campaigns and logos as well as government signs that have been made especially aimed at the interests and energy needs of households require the involvement of all elements and levels of educational institutions, non-banking finance and other micro businesses.

## SUGGESTION

Cooperation in the field of zero emission energy that is faced by the State of Indonesia in the long term will still require many tasks with a large population and the number of motorized vehicle production which tends to always increase as a fossil energy monster. expected in the short and medium-term due to the availability of alternative options that are still cheap for vehicles with fossil energy compared to EBT technology.

Implementation of long-term policies in planning the conversion of fossil to non-fossil energy functions requires the support of all parties, especially the awareness of millennials and Gen Z as the next generation of baton holders. Sources of energy raw materials to be managed into EBT are increasingly scarce, it is possible to find alternative sources with household waste with the Home-trash to Green-tech New-energy (MHGNe) Manufacturing Recycle technology.

## REFERENCES

- Airlangga Hartarto (2023), Antisipasi Krisis Energi dan Upaya Kemandirian Energi, Pemerintah Tingkatkan Bauran Energi Baru Terbarukan, sumber ekon.go.id. 24-jan-2023
- Riyandanu, Muhammad Fajar (2023), 10 Negara dengan Cadangan Minyak Terbesar, No 1 Bukan Arab Saudi, BP Statistical Review of World Energy, ASEAN Summit 2023. 26-04-2023.
- Andryanto, S. Dian (2021), Tekno Tempo.co. <https://tekno.tempo.co/read/1460843/satu-orang...>
- Menlhk.go.id (2020), Sistem Informasi Pengelolaan Sampah Nasional, Capaian Kinerja Pengelolaan Sampah, Sampah Rumah Tangga, <https://sipsn.menlhk.go.id/sipsn>.
- ANTARA News (2023), Kota/Kabupaten Penyumbang Sampah terbesar di Indonesia, <https://jateng.antaranews.com/berita/4826787/sampah>.
- Napis *et.al* (2023), Napis, Farhan, M., Rahmatulloh, Arif Rahman Hakim, & M. Tohimin Apriyanto. (2023). Meningkatkan Kesadaran Masyarakat dalam Budaya Hemat Eneerghi melalui Penyuluhan Efisiensi penggunaan Listrik Rumah Tangga. *Jurnal Pendidikan dan Pengabdian Masyarakat*, 6 (2), 107–115. <https://doi.org/10.29303/jppm.v6i2.4980>

- Raihan et.al (2022) Raihan, Fauwaz Ahmad, Imam Supriyadi, Ikhwan Syahtaria, (2022) Pembiayaan Hijau (Green Financing) dan Aturan Kebijakan pada Energi Terbarukan dalam Rangka mendukung Ketahanan Energi Nasional, <https://jurnalprodi.idu.ac.id/index.php/KE/article/view/4468#:~:text=PEMBIAYAAN%20HIJAU%20%28GREEN%20FINANCING%29%20DAN%20ATURAN%20KEBIJAKAN%20PADA,utama%20sebuah%20bangsa%20dalam%20mencapai%20visi%20dan%20misinya>.
- Fu, J., & Ng, AW (2021). Meningkatkan Aset Energi Terbarukan: Menerbitkan Obligasi Hijau melalui Kolaborasi Publik-Swasta Terstruktur untuk Mengelola Risiko dalam Ekonomi Berkembang. *Energi*, 14(11), 3076.
- Ilic et.al (2019), Ilic, B., Stojanovic, D., & Djukic, G. (2019). Ekonomi Hijau: Modal Internasional untuk Membiayai Proyek-proyek Sumber Energi Terbarukan. *Keuangan Hijau*, 1(2), 94-109.
- Nissa et.al (2022), Nissa., Choirun, Rachmawati Novaria, M. Kendry Widianto., (2022) Peran Pemerintah Daerah dalam Mendukung Kebijakan Penghematan Energi, <http://repository.untag-sby.ac.id/16832/7/JURNAL.pdf>
- Wiyata, I. Y, (2021) Pembuatan Biodiesel Minyak Goreng Bekas dengan Memanfaatkan Limbah Cangkang Telur Bebek sebagai Katalis CaO, *Jurnal Pengabdian Vokasi*, vol. 2, no. 1, pp. 69 - 74, Jun. 2021. <https://doi.org/10.14710/jpv.2021.11346>
- Yulianto, Trisno (2023), Resolusi BUMDes 2030, *Ekonomi Pedesaan*, <https://www.kompas.id/baca/opini/2023/01/17/resolusi-bumdes-2023>
- Bratadharma, Angga (2023), Pemerintah Komitmen Jaga Ketersediaan Energi Nasional Berkelanjutan, <https://www.medcom.id/ekonomi/makro/wkBjy2Dk-pemerintah-komitmen-jaga-ketersediaan-energi-nasional-berkelanjutan>.
- Airlangga & Bratadharma (2023), Pemerintah Komitmen Jaga Ketersediaan Energi Nasional Berkelanjutan, <https://www.medcom.id/ekonomi/makro/wkBjy2Dk-pemerintah-komitmen-jaga-ketersediaan-energi-nasional-berkelanjutan>.
- Al Bahij (2020), Al Bahij., Azmi., Nadiroh, Sihadi, Maulina Istiana Astari, (2020) Pengaruh Pengetahuan dan sikap hemat energy terhadap Perilaku Hemat Energi, *EDUSAINS*, p-ISSN 1979-7281, e-ISSN 2443-1281, [http://journal.uinjkt.as.id/index.php/edusains.12\(2\),2020,259-265](http://journal.uinjkt.as.id/index.php/edusains.12(2),2020,259-265).
- Joseph R. DesJardins. (2022)21. Ethical And Moral Aspects Of Energy Use. *Macmillan Encyclopedia of Energy*. Retrieved from <https://www.encyclopedia.com/environment/encyclopedias-almanacs-transcripts-and-maps/ethical-and-moral-aspects-energy-use>.
- Hazboun, S. O., & Boudet, H. S. (2020)22. Public preferences in a shifting energy future: Comparing public views of eight energy sources in North America's Pacific Northwest. *Energies*, 13(8). <https://doi.org/10.3390/en13081940>.
- Özbay R et.al (2022)23, Özbay, R. D., Athari, S. A., Saliba, C., & Kirikkaleli, D. (2022). Towards Environmental Sustainability in China: Role of Globalization and Hydroelectricity Consumption. *Sustainability (Switzerland)*, 14(7). <https://doi.org/10.3390/su14074182>.
- Schinckus et.al (2020)25, Schinckus, C., Nguyen, C. P., & Ling, F. C. H. (2020). Crypto-currencies trading and energy consumption. *International Journal of Energy Economics and Policy*, 10(3), 355–364. <https://doi.org/10.32479/ijEEP.9258>.
- Gurrib,I et.al (2022)26, Gurrib, I., Nourani, M., & Bhaskaran, R. K. (2022). Energy crypto currencies and leading U.S. energy stock prices: are Fibonacci retracements profitable? *Financial Innovation*, 8(1). <https://doi.org/10.1186/s40854-021-00311-8>.
- Agur, I, (2023)27 Agur, I., Lavayssière, X., Villegas Bauer, G., Deodoro, J., Martinez Peria, S., Sandri, D., & Tourpe, H. (2023). Lessons from crypto assets for the design of energy efficient digital currencies. *Ecological Economics*, 212, 107888. <https://doi.org/10.1016/j.ecolecon.2023.107888>
- Shtunder, I., et.al (2022)31, Shtunder, I., Kushnir, S., Perevozova, I., Kalinina, S., Savchenko, E., & Nitsenko, V. (2022). SUSTAINABLE DEVELOPMENT OF THE ECONOMY IN THE CONDITIONS OF THE ENERGY CRISIS. *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu*, (4), 156–161. <https://doi.org/10.33271/nvngu/2022-4/156>.
- Along, Hassanien A, Darwis A (2020)32, Swarm Intelligence for Resource Management in Internet of Things. *Swarm Intelligence for Resource Management in Internet of Things* (pp. 1–155). Elsevier. <https://doi.org/10.1016/B978-0-12-818287-1.00016-4>.
- Seddon, D., (2022)33. THE PRODUCTION OF HYDROGEN FROM RENEWABLE SOURCES. In *The Hydrogen Economy* (pp. 97–134). WORLD SCIENTIFIC. [https://doi.org/10.1142/9789811248559\\_0004](https://doi.org/10.1142/9789811248559_0004).
- Bris, A., et.al (2021)34, Bris, A., Wang, T. Y. H., Zatzick, C. D., Miller, D. J. P., Fern, M. J., Cardinal, L. B., ... Sangiorgi, F. (2021). KNIGHTS, RAIDERS, AND TARGETS - THE IMPACT OF THE HOSTILE TAKEOVER - COFFEE,JC, LOWENSTEIN,J, ROSEACKERMAN,S. *JOURNAL OF BANKING & FINANCE*, 37(1), 1–19. Retrieved from <https://link.springer.com/article/10.1007/s11142-010-9139-y> <https://meridian.allenpress.com/accounting-review/article-abstract/96/1/325/431284> <http://pubsonline.informs.orghttp://www.informs.org> <http://pubsonline.informs.org1638><https://doi.org/10.1287/mnsc>
- OECD (2021)35, Net Zero by 2050. Net Zero by 2050. OECD. <https://doi.org/10.1787/c8328405-en>.
- Roger, I., et.al (2022)37, Rogers, I., Carter, D., Morgan, B., & Edgington, A. (2022). Diminishing Dreams. *M/C Journal*, 25(2). <https://doi.org/10.5204/mcj.2884>

- Dzwigol, H., et.al (2023)38, Dzwigol, H., Kwilinski, A., Lyulyov, O., & Pimonenko, T. (2023). Renewable Energy, Knowledge Spillover and Innovation: Capacity of Environmental Regulation. *Energies*, 16(3). <https://doi.org/10.3390/en16031117>.
- Østergaard, P. A et.al (2022)39, Østergaard, P. A., & Johannsen, R. M. (2022, December 14). Editorial-International Journal of Sustainable Energy Planning and Management Vol 36. *International Journal of Sustainable Energy Planning and Management*. Aalborg University press. <https://doi.org/10.54337/ijsepm.7586>.
- Palmer, W. K. G. (2018)40. *Journal of Energy Conservation*. Researchgate.Net, (1), 31–40. Retrieved from [https://www.researchgate.net/profile/William\\_Palmer/publication/332227546\\_Wind\\_Turbine\\_Public\\_Safety\\_Risk\\_Direct\\_and\\_Indirect\\_Health\\_Impacts/links/5ed848cc45851529453110ec/Wind-Turbine-Public-Safety-Risk-Direct-and-Indirect-Health-Impacts.pdf](https://www.researchgate.net/profile/William_Palmer/publication/332227546_Wind_Turbine_Public_Safety_Risk_Direct_and_Indirect_Health_Impacts/links/5ed848cc45851529453110ec/Wind-Turbine-Public-Safety-Risk-Direct-and-Indirect-Health-Impacts.pdf)
- Yakupoglu, Y. A., & Okur, M. (2021)41. A Study on Perception of Financial Market Professionals in Turkey Towards Gold. *Gaziantep University Journal of Social Sciences*, 20(3), 1324–1337. <https://doi.org/10.21547/jss.865371>.
- Ratner, S., et.al. (2022)42 Ratner, S., Berezin, A., & Sergi, BS (2022). Peningkatan efisiensi energi dalam kondisi harga energi yang rendah: bukti dari wilayah Rusia. *Sumber Energi, Bagian B: Ekonomi, Perencanaan dan Kebijakan*, 17 (1). <https://doi.org/10.1080/15567249.2021.1966134>.
- Irmak, A., et.al (2023)42 Irmak, A., Kurmanov, N., Zhadigerova, O., Turdiyeva, Z., Bakirbekova, A., Saimagambetova, G., ... Seitzhanov, S. (2023). Shaping Energy-Saving Behavior in Education System: A Systematic Review. *International Journal of Energy Economics and Policy*, 13(4), 46–60. <https://doi.org/10.32479/ijeep.14366>.
- Raza, M. Y., et.al. (2020)44 Raza, M. Y., Wasim, M., & Sarwar, M. S. (2020, March 18). Development of Renewable Energy Technologies in rural areas of Pakistan. *Energy Sources, Part A: Recovery, Utilization and Environmental Effects*. Taylor and Francis Inc. <https://doi.org/10.1080/15567036.2019.1588428>.
- Breman, C., & Storm, S. (2023)46 Betting on Black Gold: Oil Speculation and U.S. Inflation (2020–2022). *International Journal of Political Economy*, 52(2), 153–180. <https://doi.org/10.1080/08911916.2023.2238565>.
- Krukowska, E., & Nardelli, A. (2022)47 EU Aims to Cut Dependence on Russian Gas by Almost 80% This Year. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2022-03-07/eu-aims-to-cut-dependence-on-russian-gas-by-almost-80-this-year>.