

Green Economic System as Environmental Protection: Case Study in Pt. Pertamina Geothermal Energy Indonesia

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Abstract

The realization of the environmental protection budget by PT PGE Ulubelu looks very large and will have a positive impact, but the process of developing and exploiting geothermal energy at PT. directly side by side with the community, considering that most of the geothermal energy is there. Then, does the use of renewable energy that is in line with the green economy still have a good impact on the environment or vice versa. A research question emerged, namely: (1) How is the concept of implementing a green economy at PT. Pertamina Geothermal Energy Area Ulubelu? (2) What is the form of environmental protection at PT. Pertamina Geothermal Energy Area Ulubelu? (3) How is the concept of green economy and environmental protection at PT. Pertamina Geothermal Energy Area Ulubelu in an Islamic economic perspective? This research uses qualitative research.. By using primary and secondary data the population in this study is PT. Pertamina Geothermal Energy Area Ulubelu, The sampling technique uses purposive sampling using saturated data, namely informants are selected with certain considerations and goals. Then the addition of the sample was stopped, when the data was saturated. The results of the analysis of this research study found interesting facts and opinions where significant positives were answered that the environment around the company implements a sustainable economy and environmental protection by planting trees and CSR programs. However, there are indeed doubts whether the drilling process will cause the things mentioned in question, the fact is that this is not true, the informants have explained in interviews as well as facts from related sources. The concept of green economy is very closely related to geothermal energy, so PT. PGE Ulubelu in particular as the object of this research is said to have implemented the concept of an environmentally friendly economy / green economy, besides that environmental protection is included in the green economy principle where sustainability is an important aspect for life in the future, PT . PGE Ulubelu with the existence of TJSL / Social and Environmental Responsibility and care about the preservation of biodiversity through the budget and its realization allows it to become a pioneer of environmentally friendly renewable energy companies as an alternative source of replacing fossil fuels. In Islamic economics, the emphasis on the prohibition of destroying and exploiting nature without regard to its maintenance is also stated in the Qur'an, Surat Ar-Rum (30): 41-42. In line with the above, PT. PGE Ulubelu is committed to preserving the environment so that vegetation and ecosystems are maintained through an annual budget which is reported in the form of an annual report on biodiversity conservation. PT PGE Ulubelu Area in carrying out exploration, exploitation and production of geothermal resources always tries to place environmental aspects and responsibilities by implementing a well-integrated Company Management System.

Key Words: Green Economy, Environmental Protection, Islamic Economies

1.0 Introduction

Fossil energy reserves in Indonesia are still abundant. This causes many parties, both from the government and the private sector to compete to obtain or take these fossil energy reserves regardless of the consequences of the mining. For example, Pertamina as the sole holder of oil and gas rights in Indonesia and its contractors are free to act arbitrarily on the nation's natural wealth. Various corruption cases within Pertamina since the New Order era to the current government have not been thoroughly investigated. Indonesia has enormous geothermal potential, which is a hidden treasure and needs to be managed to achieve energy security targets in the future. Development has changed nature and made it man-made. The conversion process exploits natural resources by involving man-made technology. This science and technology is developed by the spirit of life that is centered on self-interest and human needs, in the sense that humans are the center of every life in nature. An increase in the number of people will increase the exploitation of natural resources, while the area of the earth and the capacity of its resources will not increase.ⁱ

Such a huge potential until now has only managed about 4% of the existing potential. The National Energy Policy has announced that in 2025 Indonesia will increase the energy mix from renewable energy by 23% and the role of geothermal energy by 9%, this does not yet show the maximum exploitation of geothermal energy in Indonesia, while in the energy policy in 2050 Indonesia states that it is already in a state of energy resistance. Dependence on fossil energy needs to be ended by utilizing alternative energy potentials that exist throughout Indonesia such as hydropower, wind, geothermal, and biomass. The alternative energy potential that is very promising to be utilized is geothermal, because Indonesia has the largest reserves in the world, namely 40%, besides that the use of geothermal is very efficient and economical and environmentally friendly compared to fossil energy. Geothermal is a form of renewable energy that produces few greenhouse gas emissions and can provide energy stability and security.ⁱⁱ

Table 1.1 Actual Amount of Expenditures for Biodiversity Protection and Environmental Preservation
PT.PGE Ulubelu Tanggamus

PGE Ulubelu	In million rupiah			
	2018	2019	2020	2021
	401.47	382.00	435.00	431.00

Source: Annual Report of PT. PGE Ulubelu in 2021

Running PGE's environmental conservation programs using internal funds from the Company and also financial support from PT Pertamina (Persero) as the Parent Entity. Every year PT. PGE makes a budget plan so that these programs run smoothly. It can be seen in table 1.1 above that in a period of 4 years from 2018 to 2021 it continued to increase except in 2019 which experienced a decline, in 2020 the realization was the largest among previous years, then in 2021 the realization decreased slightly from the previous year, thing this is a form of responsibility in an effort to preserve nature and protect the environment at PT.PGE and its surroundings. In the area managed by PGE Ulubelu, there are competent personnel in the environmental field, especially in the field of natural environment preservation. PGE has also issued an order letter to the Natural Environment Protection Team which consists of a Coordinator and one to two members, who are directly responsible to the General Manager / Area Manager.ⁱⁱⁱ

Based on a review from an Islamic point of view, protecting nature (environment) so that it is maintained is a must for every human being. Humans as *caliphs* (representatives of God) on earth are supposed to preserve and develop nature (earth) which is the home of mankind. ^{iv}A caliph is certainly not allowed to use this earth as he pleases, especially in exploiting it. In its utilization, it must be able to maintain its ecosystem and must be proportional and rationale for the needs of the community and its future generations. This is also stipulated in the hadith of the Prophet that not a single branch may be damaged by humans, as an effort to preserve or manage the environment. Humans do not realize that by destroying the environment, their lives will be disrupted and cause discomfort in their lives, where various disasters will occur.^v

Allah's Word in *Al - Hud* 61:

﴿ وَالَّذِينَ آمَنُوا وَعَمِلُوا الصَّالِحَاتِ لَهُمْ أَجْرٌ كَبِيرٌ ﴾
٦١- مُجِيبٌ

Translate :

"And to the samud (We sent) their brother, Saleh. He said, "O my people! Worship Allah, there is no god for you but Him. He has created you from the earth (soil) and made you prosperous, therefore ask Him for forgiveness, then repent to Him. Indeed, my Lord is very near (His mercy) and allows (the prayers of His servants)."^{vi}

2.0 Methodology

This study uses a type of qualitative research, which is a multi-method focus, involves interpretation, a natural approach to the subject matter. This means that qualitative research studies things in their natural setting, seeking to understand and interpret phenomena in terms of their societal meaning. Qualitative research involves studying and collecting a variety of empirical materials, case studies, personal experience, introspective, life history, interviews, observational, historical, interactional, and visual texts that describe the routines and problems of time and the meaning of individual life.^{vii}

a. Primary data

Primary data is data obtained directly from respondents, informants, objects studied or anything to do with the object under study. The data was obtained directly from the personal being studied and came from the field. Primary data in this study were used by means of observation, documentation, questionnaires, and interviews with related parties. The primary data used in the preparation of this study were employees and general managers of PT. Pertamina Geothermal Energy Area Ulubelu, Tanggamus.

b. Secondary data

Secondary data is data obtained by other parties and we as researchers do not directly collect this data. So, people say secondary data is second hand data. Secondary data analysis is a research strategy which uses existing data, where the goal is to find answers to a research question that must be different from previous research (the data is generated). Secondary data sources can be in the form of previous personal research or even large-scale surveys.^{viii} Secondary data is "data sources that do not directly provide data to data collectors". Examples such as from other people or documents. Secondary data is data that supports the needs of primary data. The secondary data used in this research are journal documents.^{ix} Secondary data is data obtained in a ready-made form, which has been collected and processed by other parties, usually in the form of publications. In this study the authors obtained data from libraries, literature books and secondary data obtained from documents in institutions related to the problem. Based on the explanation above, the researcher determines the second data source or secondary data as a research reference, through portals and data from journals, books, magazines and news.

c. Population and Sample

The population is the totality of all objects or individuals who have certain, clear and complete characteristics to be studied. The population is also a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by the researcher to be studied and then conclusions drawn. The population is the total number consisting of objects or subjects that have certain characteristics and qualities determined by the researcher to be studied and then conclusions drawn^x. In qualitative research, the term population is not used, but by Spardley it is called a " *social situation*" or a social situation consisting of three elements, namely: place, actors, and activities *that* interact synergistically. The social situation can be at home with family and their activities, or people on street corners chatting, or at work, in cities, villages or regions of a country. This social situation can be stated as an object of research that wants to know "what happened" in it. In social situations or research objects, researchers can observe in depth the activities of people (*actors*) in certain *places*. In this study the 3 elements are the *place* at PT. Pertamina Geothermal Energy area Ulubelu, actors (*actors*), namely employees at PT. Pertamina Geothermal Energy area Ulubelu, and activity (*activity*), namely environmental protection.

The sample is part of the population. Those taken in certain clear and complete ways are considered to be representative of the population. The sample is part of the number and characteristics possessed by the population. Determination of the sample was carried out using the *Purposive Sampling method*, namely the sampling technique of observing and interviewing people who are deemed to know about the social situation. Determining data sources on interviewees was carried out purposely, namely selected with certain considerations and objectives. Then the

addition of the sample was stopped, when the data was saturated. From various informants, both old and new, they did not provide any new data. If the selection of samples or informants really falls on subjects who really master the social situation under study (objects), then it is an advantage for the researcher, because it does not require many more samples, so the research is done quickly. So what is a concern for qualitative researchers is the "completeness" of obtaining information with a variety of existing variations, not the number of samples of data sources. In simple terms, in qualitative research it is known as saturated data. Saturated data means that whenever and wherever the informant is asked (data triangulation), and whoever the same question is asked, the results of the answers given are consistently the same. It was then enough for the researcher to stop the data collection process.^{xi} In qualitative research, the selection of informants with the intention is not always representative of all research objects, but what is important is that informants have sufficient knowledge and are able to explain the actual situation of the research object.^{xii}

Table 2.1 Names of informants and their positions^{xiii}

No	Informant Category	Respondent Name	Position
1	Main Informant	Imam Nudjul Fadhillah	Administrator VI
2		Arif Mulizar	senior Supervisors External Relations
3		Agus Sri Suratih	Administrator II
4		Mahendra Azulni	Public Relations Assistant
5		Bambang Nurcahyono	Senior Well Test and Sampling
6		Yovin Septian Ardi	Mechanic III
7		Joko Septriyono	Laboratory III
8		Muhammad Ulfi Aulia	Electrician III
9		Diana Saputra	Civilian II
10		Agesta Dwi Ariyanti	Administrator IV
11		Herli Apriawan	Caretaker CCR II
12		Darmanto	HSE Officer III
13		Muhammad Sumarlin	Technician III
14		Mustakim	Mechanic II
15		Joko Purwanto	Production Caretaker II
16		Sigit Purwoko	Electrician I
17		mate	Production Maintenance Manager I
18		Rani Utami	Administrator III
19		Prasetyo	Production Field Manager III
1	Supporting Informants	Subari	Driver Sampling IV
2		Diah Yunda Sari	Administrator III
3		Firdinan Ali Handoyo	Production Field Worker II
4		Hardiyanto	Warehouse Material Manager III
5		Anis Kurnia Dewi	Administrator IV
6		Sirman Hadi	Computer Operator III
7		Anita Yuli Astuty	Administrator II
8		Yuli Dwi Lestari	Administrator III
9		Reza Erlangga	Administrator V
10		Udi Ismoyo	Operations Technician
11		Subur Muhammad	Procurement Support (Buyer)
12		Poda Antonius Surbakti	Support Logistics
13		Bambang Nurcahyono	Senior Well Test and Sampling
14		M Andika Tri Hermawan	Functional Support
15		Dio Phesyfera H	IT & Data Network Administrators

The data above was obtained from an interview process with employees at PT. Pertamina Geothermal Energy Area Ulubelu Tanggamus, the age of the informants ranges from 24-50 years with a Bachelor's degree educational background from various specialization study programs and tertiary institutions. The informants for this study were taken based on certain considerations, where the informants were considered to know the situation that occurred related to the object of research, making it easier for researchers to search and understand the object being studied. The informants are as follows:

- a) Main informants: The main informants in this study were CSR executives, administration, laboratories, technicians, HSE, and others.
- b) Supporting informants: Supporting informants in this study are staff in other functions.

1. Data collection technique

Data collection in qualitative research needs attention, because the quality of research is very dependent on the quality and completeness of the data that has been obtained. Questions that are always considered in data collection are what, where, when, and how. Qualitative research usually relies on data triangulation obtained from three methods, namely interviews, participant observation, and document analysis (*document record*).^{xiv}

a. Interview Techniques

Interviews are conversations with a specific purpose. The conversation was carried out by two parties, namely the interviewer who asked the question and the interviewee who gave the answer to the question. An interview is a meeting between two people to exchange information and ideas through direct debriefing with the respondent or listening directly to information relating to the problem being researched.

b. Observation Techniques

Make observations on matters relating to research. According to Spadley there are three stages of observation, namely descriptive observation, focused observation, and selected observation. Researchers also made observations to PT. Pertamina Geothermal Energy Area Ulubelu. This aims to obtain information that is more accurate, complete, sharp and to know the meaning of every phenomenon that occurs at the research site.

c. Documentation Techniques

Documentation is the process of finding a data source in the form of writing, pictures, notes, books, which are about the problem being researched. Documentation is also a data collection technique that originates from documents and written records and studies carefully on matters relating to the required data. Data collection methods are methods that can be used by researchers to collect data. How to point to something abstract, can not be realized in objects that are visible, but can only be shown its use.^{xv}In this study the researchers used the second data or *secondary research* several data collection techniques as follows:

- Mass media
- Central Bureau of Statistics (BPS)/data bank center
- Government/Private Institutions
- Book
- Articles/journals
- News portal

3.0 Results

3.1 Tables and Figures

Data collected from PT. Pertamina Geothermal Energy Area Ulubelu below you can see the amount of each year's actual spending in terms of environmental preservation.

Table 3.1 Actual Amount of Expenditures for Biodiversity Protection and Environmental Preservation PT.PGE Ulubelu Tanggamus

PGE Ulubelu	In million rupiah			
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Source: Annual Report of PT. PGE Ulubelu in 2021

Running PGE Ulubelu environmental conservation programs using internal funds from the Company and also financial support from PT Pertamina (Persero) as the Parent Entity. Every year PT. PGE makes a budget plan so that these programs run smoothly. It can be seen in table 4.1 above that in a period of 4 years from 2018 to 2021 it continued to increase except in 2019 which experienced a decline, in 2020 the realization was the largest among previous years, then in 2021 the realization decreased slightly from the previous year, thing this is a form of responsibility in an effort to preserve nature and protect the environment at PT.PGE Ulubelu and its surroundings. In the area managed by PGE Ulubelu, there are competent personnel in the environmental field, especially in the field of natural environment preservation. PGE has also issued an order letter to the Natural Environment Protection Team which consists of a Coordinator and one to two members, who are directly responsible to the General Manager / Area Manager.^{xvi}

Crucial interview questions according to the title of the proposed research are whether the PT. Pertamina Geothermal Energy through its *Corporate Social Responsibility* (CSR) is one of the *green economy implementations* ? Then the informant answered *"PT. Pertamina Geothermal Energy is a green energy company that produces clean energy and also contributes to society through CSR with a green economy concept, one of which is the coffee drying program using steam."*^{xvii}

In accordance with the results of the researcher's interview with several employees of PT. Pertamina Geothermal Energy with interview questions how are the environmental conditions at PT. Pertamina Geothermal Energy? Then shows the answer *"because PT.Pertamina Geothermal Energy does not produce CO2 as a result of combustion as a power plant in general, the environmental conditions of PT. Pertamina Geothermal Energy tends to meet the threshold value besides PT. Pertamina Geothermal Energy contributes to greening the environment by planting trees so that environmental conditions become better."*^{xviii}The second question is asked how PT. Pertamina Geothermal Energy guarantees environmental protection in your opinion? The same informant as before answered *"guarantee by ensuring that every operational activity runs safely and meets predetermined standards, PT. Pertamina Geothermal Energy meets both national and international standards in environmental management."*^{xix}

Based on the results of the interview above, the production activities carried out by PT. Pertamina Geothermal Energy Area Ulubelu is in accordance with standard operating procedures that have been set, the realization of previous data shows positive results for the environment, besides that the recognition from the Ministry of Environment and Forestry of the Republic of Indonesia proves that the attention of PT. PGE is not playing games with environmental sustainability, as evidenced by the following achievements:

Figure 3.1 Proper Trophy from the Indonesian Ministry of Environment and Forestry



www.pge.pertamina.com

PT Pertamina Geothermal Energy (“PGE”) Ulubelu Area in Tanggamus Regency, Lampung Province again won the Green PROPER award for its environmental management performance in the mining, energy and oil and gas sectors in 2018. The award for PGE Ulubelu was handed over by the Minister of Environment and Forestry, Siti Nurbaya Bakar to PGE Director of Operations, Eko Agung Bramantyo on the eve of the 2018 Proper Environment Award, Thursday (27/12/2018), at the Bidakara Hotel Jakarta. This award shows that PGE Ulubelu has been able to manage operational activities well and maintain environmental aspects, such as energy, emissions, water, and B3 and Non-B3 waste. As a renewable energy source, geothermal energy developed by PGE Ulubelu is truly clean energy without the potential to damage the environment. In addition, the development of geothermal energy is also renewable so that it can take place continuously by maintaining the condition of the reservoirs that are in the earth. In addition to these things, the proper assessment is also based on various CSR (*Corporate Social Responsibility*) activities that have been carried out in Ulubelu. PGE Ulubelu's CSR is used to empower the community around Ulubelu District, including for freshwater fish cultivation, developing Saburai goat livestock, making coffee-flavored bread from cassava flour, empowering coffee farmer groups and building and repairing access roads to Ulubelu.^{xx}

Table 3.2 Report on Greening and Maintenance Activities of PT. PGE Ulubelu

Protection Activities	2017		2018		2019		Unit
	Absolute Result	Budget (Rp. Million)	Absolute Result	Budget (Rp. Million)	Absolute Result	Budget (Rp. Million)	
Greening and Maintenance	3,080	175	4.700	141.47	5,546	170	stem

Source: *Report on the realization of environmental protection and greening PT Pertamina Geothermal Energy Area Ulubelu 2020*

PGE for the Ulubelu Area has carried out a reforestation program in collaboration with the Batutegi Forestry Service Office of Lampung Province, which has been implemented since 2013. Until now, there have been 35 types of plants recorded with the number of individuals/seeds planted around 241,233 individual trees and shrubs have been planted throughout the Ulubelu area, especially critical lands, or disturbed vegetation due to well construction and exploration activities. The majority of the green plants planted are shade trees and fruit trees. Various types of green plants, which are generally shade plants and fruit trees, contribute to shaping the vegetation landscape, rehabilitating degraded lands, preventing erosion, and providing living habitats for various types of fauna. In addition, this reforestation also supports the Lampung Provincial Government's program to protect the catchment area of the Batu Tegi Protection Forest.^{xxi}

The above was also supported by the answer of one of the informants with the question, according to you, is the use of geothermal wise in its management? *"Yes, it's wise in the sense that all the process activities involved in it related to production and others will not damage the environment because previously it has gone through long stages, besides that there is no exploitation of nature because we apply the concept*

of sustainability, so that new vegetation is formed, critical land is reduced, even though the existence of this PT is in a relatively mountainous place but we don't necessarily destroy it, the PT also has a budget every year”^{xxii}

“The production process of PT. PGE Ulubelu Area in general, the fluid will rise and exit through the production wells and then flow into the separator to be separated between steam and water, the steam will be forwarded to the PLTP to turn the turbine so it can generate electricity. The remaining fluid will be reinjected through the reinjection well, so that the production process is known as the closed system. so it doesn't produce additional waste or carbon dioxide” from Mr. Muhamad Didi as a Community Development Officer.

Table 3.4 Total Realization of PT.PGE Ulubelu's Social and Environmental Responsibility Expenditure

Year	Number (in millions)
2018	6,490
2019	1,150
2020	3,072
2021	2,803

Source: PT. PGE Ulubelu 2021 Report

From the data above it is clear that PT. PGE in its annual report is not just a figment. It is proven that the realization report every year shows the great capability and responsibility of PT. PGE towards social and environmental sustainability that intersects with the area of PT.

Table 3.5 Research Indicators on Research Objects

Indicator	GreenEconomy	Environmental Protection	Application at PT. PGE Ulubelu	In Perspective of Islamic Economics
Economic growth without destroying the environment for the future (Social Aspect)	Low carbon dioxide emissions	EIA	Implementation and management are regulated in the SOP	Ibn Khaldun's concept of utility
Use of renewable energy as an alternative to fossil energy which is not environmentally friendly (Environmental Aspect)	Geothermal Energy	Use of environmentally friendly energy	Refers to the main energy produced, namely geothermal or geothermal	The concept of <i>Al-Adl</i> Utilization of natural resources without destroying
Use of natural resources without exploiting (Economic Aspect)	TJSL (Environmental Social Responsibility) Concept	CSR	There is a budget and annual reports related to these two matters	The concept of taawun and not harming other parties

Source: Data processed by researchers in 2022

Explanation of each aspect of the indicator

1. Social/CSR Aspect

PT. Pertamina Geothermal Energy Area Ulubelu has attempted to implement synergistic efforts in sustainable environmental management , one of which can be seen from efforts to build and maintain commitments. This can be reflected in the company's K3LL and Security policies. The policy has the following contents:

1. Comply with and implement the provisions of laws and regulations and related requirements that apply to the company.
2. Optimizing the quality and quantity of steam and electricity supply in an environmentally sound manner according to commitments to customers by prioritizing K3LL aspects and company security in carrying out its activities.
3. Ensuring safe and healthy working conditions and preventing overcoming work accidents, work-related diseases and environmental pollution (water, air and soil pollution).
4. Commitment to implementing resource conservation, energy efficiency, water conservation, emission reduction, reduction and utilization of B3 and Non-B3 waste, protection of biodiversity, prevention of losses and always making efforts to continuously improve the quality management system, occupational health and safety and the environment in every aspect.
5. *Corporate Social Responsibility* programs in order to create and maintain healthy and harmonious relationships with stakeholders (companies, customers, workers, business partners, government agencies, related institutions and the surrounding community) and support the increase in community economic independence.
6. Actively communicate company policies to all *stakeholders*

The policy was signed directly by the General Manager of PT.Pertamina Geothermal Energy Area Ulubelu on April 2 (two) 2015. The policy cannot be attached because it is a confidential company document.^{xxiii}

Table 3.6 Total Realization of PT.PGE Ulubelu's Social and Environmental Responsibility Expenditure

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2. Environmental/Reforestation Aspects

As a company that cares about the environment, PGE Ulubelu Area participated in the 2020 tree planting activity in commemoration of Indonesian Tree Planting Day at Pekon Ngarip, Ulubelu District, Tanggamus Regency, Lampung, 28 November 2020. The activity was held with HIPMI of Tanggamus Regency, Rainforest and the local government of Tanggamus Regency, attended by the Regent of Tanggamus Hj. Dewi Handajani and Deputy Regent Hi. AM. Syafi'I, Head of DPC HIPMI Tanggamus Fandi Ahmad Damsyik, General Manager of PGE Area Ulubelu Mawardi and Farmer Groups in Ulubelu District. The Regent of Tanggamus Hj. Dewi Handajani in her remarks appreciated PGE Ulubelu Area for participating in this activity by providing 750 avocado tree seeds. On this occasion, the Regent of Tanggamus Hj. Dewi Handajani also presented an award to PGE Ulubelu Area for her concern for environmental activities and awards for corporate social responsibility (CSR) activities. The General Manager of PGE Area Ulubelu Mawardi is very grateful for the company's efforts and contributions to the environmental activities and CSR programs that have been implemented.^{xxiv} The development of the geothermal business in Indonesia still encounters several obstacles, including the process of completing regional permits such as AMDAL, IPPKHL and SIPPA which takes a long time, geothermal working areas are mostly located in protected forest areas and nature reserves so that they have to seek the conversion of nature reserves become a protected forest, the price of which still does not fully support the economic aspects of geothermal energy. Therefore, in addition to maintaining the performance and development of geothermal areas, the Company also continues to focus on establishing coordination with various stakeholders in order to optimize the development of Indonesia's geothermal potential.

In accordance with the results of the researcher's interview with several employees of PT. Pertamina Geothermal Energy with interview questions how are the environmental conditions at PT. Pertamina Geothermal Energy? Then shows the answer "because PT. Pertamina Geothermal Energy does not produce CO2 as a result of combustion as a power plant in general, the environmental conditions of PT. Pertamina Geothermal Energy tends to meet the threshold value besides PT. Pertamina Geothermal Energy contributes to greening the environment by planting trees so that environmental conditions become better." ^{xxv} The second question is asked how PT. Pertamina Geothermal Energy guarantees environmental protection in your opinion? The same respondent as before answered "guarantee by ensuring that every operational activity runs safely and meets predetermined standards, PT. Pertamina Geothermal Energy meets both national and international standards in environmental management" ^{xxvi}

Table 3.7 Plants/Flora around PT Pertamina Geothermal Energy

No	Tree Type Name
1	Africa
2	Bayur
3	Fir
4	chrysolite
5	Clove
6	Durian
7	Gamal
8	Guava
9	Cocoa
10	Coconut
11	Coffee
12	Lamboro
13	Mahogany
14	Melinjo
15	Jackfruit
16	Pawpaw
17	betel nut
18	Banana
19	Sure
20	Trembesi
21	waru

Source: *Biodiversity Report*
PT Pertamina Geothermal Energy Area Ulubelu 2020

3. Economic Aspect through empowerment

Utilization of PLTMH as an Energy Source to Drive Post-Harvest Coffee Processing Machines, coffee is a source of livelihood for the people of Ulubelu sub-district, Tanggamus district, Lampung. To produce high-quality coffee, farmers still experience limited knowledge and expertise in coffee management, starting from the planting process to post-harvest processing. PGE established Coffee Learning Houses as a forum for farmer groups to learn and obtain information about optimal coffee management from upstream to downstream. The innovation that has been used is the use of high pressure machines to fry coffee beans and brines to dry coffee beans so that productivity and quality increase but the impact on the environment can be minimized. In addition, PGE has also contributed to the development of a Micro Hydro Power Plant (PLTMH) which utilizes fast flowing rivers as an energy source for coffee farming communities in remote areas. With the PLTMH, the community can carry out activities without having to worry about the availability of electricity in their area, including being used as a driving machine for post-harvest coffee processing such as the frying process (roasting). ^{xxvii}

PT Pertamina Geothermal Energy (PGE) Ulubelu Area in Tanggamus Regency, Lampung Province, part of Pertamina New & Renewable Energy has created a community empowerment program by optimizing the potential of coffee plants to improve the economy of residents around the operating area

through Coffee Learning Houses and Coffee-Geotourism. General Manager of PGE Ulubelu Area, Andi Joko Nugroho stated that PGE is not only focused on improving the economy of coffee farmers in Ulubelu, but also educating coffee farmers to care about the environment. Farmers must also be aware and care about the environment so that their agricultural activities can continue well. "In collaboration with the Association of Farmers Groups (Gapoktan), we created a Coffee Learning House program in Sukamaju Village, Ulubelu. The goal is to increase the capacity of coffee farmers so that quality coffee is produced and the selling price will increase," Andi said in an official statement in Jakarta, Monday. According to Andi, coffee farmers must focus on quality, not just quantity. In this way, the volume of coffee cultivation in protected forests can be reduced. He admitted that environmental issues were a challenge in coffee cultivation in Ulubelu.

Gapoktan and PGE of the Ulubelu Area conducted shade plant nurseries independently of 5,000 trees. *Indigofera* which will be planted in the plantation area of coffee farmers functions as a shade plant. "Through this shade tree, it is hoped that it can increase crop productivity, maintain soil fertility, and preserve forests," he explained. PGE Ulubelu has asphalted a 20 km hotmix highway from Pekon Gunung Megang, Pulau Panggung District to Pekon Ngarip, Ulubelu Tanggamus District, Lampung. PGE Ulubelu's CSR is used to empower the community around Ulubelu District, including for freshwater fish cultivation, development of goat livestock, making coffee-flavored bread from cassava flour, and building three mosques. Previously it was reported, the asphaltting of roads in the village of Ulubelu Sub-District in a total of 20 km was part of PT PGE Area Ulubelu's form of social care (CSR) towards the surrounding community. According to Exploration and Development Director of PT Pertamina Geothermal Energy Khairul Rozaq, accompanied by GM PGE Area Ulubelu Dirgo Rahayu, some time ago, as a form of concern for environmental preservation and protecting forest ecosystems, Pertamina will also plant 14,000 fruit trees and hard-rooted plants. others around the Ring I area of Ulubelu District. Dirgo Rahayu said, PGE Ulubelu Area throughout 2015 had carried out several programs for community economic development and environmental preservation, such as empowering freshwater fish farming, developing a coffee-flavored bread business from cassava flour, and increasing the ability of goat breeders.

PT Pertamina Geothermal Energy currently has 12 Geothermal Working Areas (WKP) with a current total installed capacity of 437 MW, of which 110 MW is obtained from the Ulubelu Area. Saburai goat, that's the name of the breed. Goats which are the result of crossbreeding between *Ettawa* and *Boerawa* have long been the pride of Tanggamus Regency, Lampung Province. Its fast growth, large body and muscularity are the strengths of the Saburai goat. Just imagine, at the age of eight months the size of this goat is equivalent to the age of two years of ordinary goats. This advantage is also the reason why many residents in the highlands of Tanggamus cultivate Saburai amidst their busy coffee, clove and pepper plantations. One of them is Sumardi. The residents who are ethnically from Gunung Kidul, Yogyakarta, grouped with 24 other people to form the Joint Business Development Farmers Group which is domiciled in Ngarip Village, Ulubelu District, Tanggamus. They are cultivating Saburai goats at a location which is about 20 minutes away from the Ulubelu Area PT Pertamina Geothermal Energy (PGE) Office. Sumardi told how he and his colleagues started developing Saburai and how PGE assisted them. Sumardi and his friends started cultivating Saburai in 2015 with the help of PGE with as many as 6 male Saburai. Then in 2016 they received assistance again from PGE with as many as 20 female Saburai.

The goats were then handed over to the members of the farmer group. Each member has a breeding cage placed near the house. This assistance does not directly belong to the farmer, but belongs to the community. Sumardi explained that new members could own Saburai after the broodstock started giving birth, with the obligation to deposit IDR 200,000 per head into the farmer group treasury. The funds were used for the operation of the farmer group. In just a few years, there have been 53 Saburai from this farmer group. The friendly atmosphere of the members of the farmer group is palpable. Every month they gather to talk about the development of Saburai with each member. This meeting is also a place to establish togetherness and kinship between them. During the meeting, several activities were also held which also added to the value of togetherness. One of them is by holding social gathering activities. In the meeting held, the members of the farmer group did not discuss feed ingredients, because grass and leaves that can be used as Saburai feed are widely available in Tanggamus, Ulubelu. "With the help of the Saburai Goat from PGE, group members get added value economically in their goat farming business," concluded Sumardi.^{xxviii}

Sustainable development, especially goal 7 (clean and affordable energy), 12 (responsible construction and production), 13 (handling climate change), and 15 (terrestrial ecosystems) on SDGs (Sustainable Development Goals), Company Performance Rating Program in Management Environment (PROPER) is an evaluation of the performance of the person in charge of a business and/or

activity in the field of environmental management, which is a Public Disclosure Program for Environmental Compliance. This program is complementary in nature and is a form of government policy through the Ministry of Environment and Forestry, to improve the company's environmental management performance in accordance with what has been stipulated in the laws and regulations. Furthermore, PROPER is also a manifestation of transparency and democratization in environmental management in Indonesia. The application of this instrument is an effort by the Ministry of Environment and Forestry to apply some of the principles of good governance (transparency, fairness, accountability and community involvement) in environmental management. The PROPER assessment criteria consist of two categories, namely compliance assessment criteria and beyond compliance criteria. The PROPER achievement is Blue for companies that comply with environmental management regulations, Green for companies that have gone beyond compliance in environmental management. While Gold is for companies that have excelled in environmental management and community development.^{xxix}

4.0 Conclusion

Based on the discussion and analysis, several conclusions can be drawn as follows:

The concept of implementing a green *economy* at PT. Pertamina Geothermal Energy Area Ulubelu positively answered that the environment around the company implements a sustainable economy and environmental protection by planting trees and CSR programs. However, there are indeed doubts whether the drilling process will cause the things mentioned in question, the fact is that this is not true, the respondents have explained in interviews as well as facts from related sources. The concept of *green economy* is very closely related to geothermal energy, so PT. PGE Ulubelu in particular as the object of this research is said to have implemented the concept of an environmentally friendly economy / *green economy*, besides that environmental protection is included in the green economy principle where sustainability is an important aspect for life in the future, PT. PGE Ulubelu with the existence of TJSL / Social and Environmental Responsibility and care about the preservation of biodiversity through the budget and its realization allows it to become a pioneer of environmentally friendly renewable energy companies as an alternative source of replacing fossil fuels.

The form of environmental protection at PT. Pertamina Geothermal Energy Ulubelu Area, namely the PGE Ulubelu Area's commitment to supporting the preservation of biodiversity is realized through conservation, monitoring and inventory of biodiversity, as well as reforestation. These activities were carried out in collaboration with the Batutege Forest Stakeholder Area (KPH) of the Lampung Provincial Forestry Service. In the area managed by PGE Ulubelu, there are competent personnel in the environmental field, especially in the field of natural environment preservation. PGE has also issued an order letter to the Natural Environment Protection Team consisting of a Coordinator and one to two members, who are directly responsible to the General Manager / Area Manager

The concept of *green economy* and environmental protection at PT. Pertamina Geothermal Energy Area Ulubelu in an Islamic economic perspective, namely emphasizing the prohibition of destroying and exploiting nature without regard to its maintenance is also stated in the Qur'an Surah Ar-Rum (30): 41-42 . In line with the above, PT. PGE Ulubelu is committed to preserving the environment so that vegetation and ecosystems are maintained through an annual budget which is reported in the form of an annual report on biodiversity conservation. *PT PGE Ulubelu Area in carrying out exploration, exploitation and production of geothermal resources always tries to place environmental aspects and responsibilities by implementing a well-integrated Company Management System.*

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