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Geothermal: From Education to a New Solution for Renewable Energy

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ABSTRACTS

Fossil energy is still the main contributor in Indonesia. In fact, based on a study it is stated that fossil fuels will only last 50-70 years. For this reason, it is necessary to increase the role of geothermal energy as renewable energy. Geothermal energy is very good if it is developed into a new and renewable energy source because it has a good impact on the environment. Geothermal energy also does not damage the local conditions such as mining activities so that biodiversity is preserved. Then, the operation period of the Geothermal Power Generation (known as PLTP) can be more than 30 years and does not require fuel. Geothermal energy is environmentally friendly, and its potential impact on pollution is minimal. Thus, geothermal energy is the right solution to overcome dependence on fossil energy that is not renewable and is expected to run out in the near future.

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1. INTRODUCTION

Figure 1 shows the geothermal potential In Indonesia, fossil energy is still the main contributor. In fact, based on a study it is stated that fossil fuels will only last 50-70 years. For this reason, it is necessary to increase the role of geothermal energy as a renewable energy (Moya et al., 2018). In fact, Indonesia is listed as one of the freshest with the potential for the world's largest geothermal plant with a potential of more than 23.9 GW (Gigawatt). Unfortunately, Indonesia has only utilized this potential of only 8.9%. Unfortunately, there are still many people who dont know much about geothermal energy.

2. METHODS

People who still do not understand geothermal indicate the lack of information obtained. Figure 2 we made geothermal educational videos so that people understand about geothermal and can support the government in managing geothermal energy.

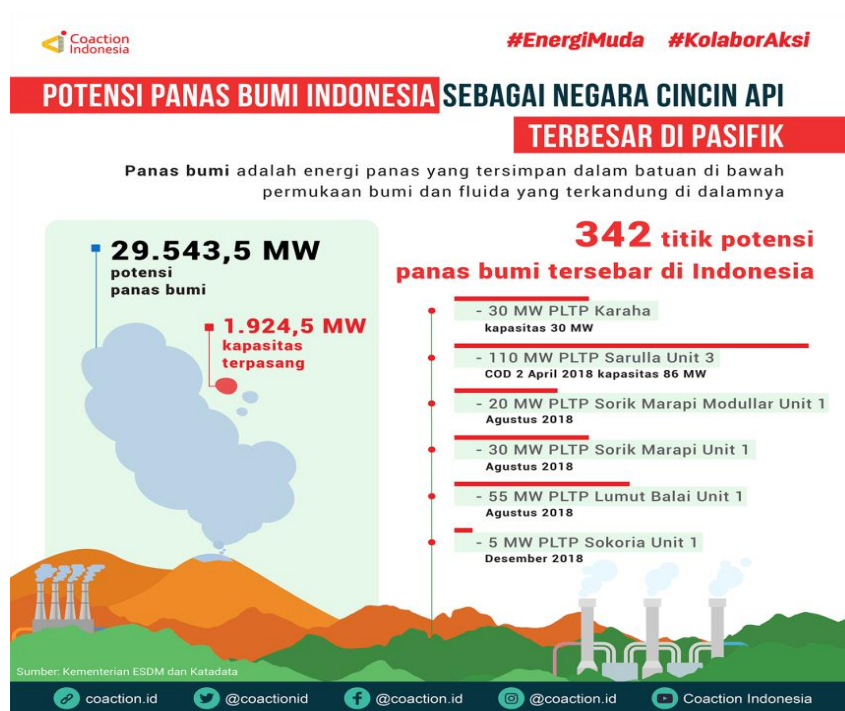


Figure 1. Geothermal Potential In Indonesia



Figure 2. Education video

3. RESULTS AND DISCUSSION

3.1. Geothermal Definition

Figure 3 shows Geothermal energy is heat energy that is present and formed in the Earth's crust. The temperature beneath the Earth's crust increases with increasing depth. According to Law no. 27 of 2003 Concerning Geothermal, geothermal resources are sources of heat energy contained in hot water, water vapor, and rocks along with associated minerals and other gases, all of which are genetically inseparable in a geothermal system and for their utilization a mining process is required, which can be used for electricity generation or other direct use (Silambi, 2019; Ray, 2019).

3.2. The Process Of Converting Geothermal Energy Into Electrical Energy

Figure 4 shows geothermal processing where water vapor that comes out of the geothermal area can be used directly. However, if the heat of the earth is in the form of hot water then it is processed first to become water vapor using a heat exchanger machine. After cleaning, this steam will flow to the turbine, the turbine will then rotate the generator. And this generator will convert the kinetic energy into electric energy.

The vapor that comes out of the furnace will then enter the condenser to be condensed. The vapor will change its form to liquid which is called condensate. The condensate is then drained into the cooling room to cool the temperature. Then the relatively cooled water is injected back into the earth through the injection well. This is what makes geothermal energy a sustainable energy (Mahood *et al.*, 2015).



Figure 3. Geothermal distribution map



Figure 4. Geothermal processing

3.3. Why energy should be geothermal?

Geothermal energy is environmentally friendly and its potential impact on pollution is minimal. Based on the Indonesian refinery reference, the CO₂ emissions produced are only around 75 grams / kWh, much lower than the emissions produced by natural gas, petroleum, diesel or coal.

In addition, geothermal energy also does not damage the local conditions such as mining activities so that biodiversity is preserved. Then, the operation period of the PLTP (Geothermal Power Generation) can be more than 30 years and does not require fuel (Alhamid et al., 2016). So that there is no escalation in the cost of fuel which means that it will be more stable in the future. In addition, the utilization of the Earth's Heat can be more constructive to realize the local energy

4. CONCLUSION

Geothermal energy is heat energy that is present and forms in the Earth's crust. Geothermal energy is very good if it is developed into a new and renewable energy source because it has a good impact on the environment. The potential of 23.9 GW must be utilized as well as possible. This of course must be accompanied by knowledge and support from the community

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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