Tax incentive policy and emission crediting system to support geothermal development

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Abstract. This study aims to determine the tax incentive policy associated with the emission carbon crediting system in order to encourage the geothermal energy development for power generation. This research used qualitative approach with descriptive method. The data was obtained through literature study (secondary data). The results showed that tax incentive policy related to emission carbon crediting system to encourage the geothermal energy development for power plant currently is not optimal. Utilization of geothermal power for generators reduces CO_2 emission and saves fossil energy. Geothermal development supports mitigation on climate change by reducing the GHG emission. Providing tax incentives by considering emission carbon crediting system allows geothermal investments to grow to meet the electricity needs for the people.

1. Introduction

The Indonesian government has issued a geothermal tax incentive policy since 1991. The policy aims to attract investors in the development of geothermal energy. However, the development of geothermal energy is still relatively low. Until now, the utilization of geothermal energy reached 5.94 percent of the potential of geothermal energy in Indonesia amounting to 28,579 MW [1].

One of Indonesia's strategies to develop investment in the geothermal industry is through the provision of tax incentives [2]. However, some parties stated that the geothermal tax incentive policy was not optimal [3].

The tax incentive policy creates a dilemma. The incentive provision policy is aimed to attract investors to develop the economy, but on the other hand, the policy is considered to be detrimental to the potential of state revenue from taxes, thus hampering public services. Therefore, a study that can be an alternative relevance in providing tax incentives for the geothermal industry is needed. This alternative would be a justification for the provision of relevant tax incentives for the welfare of the community.

Geothermal development has an important role in supporting the handling of climate change issues. Addressing the problem of climate change requires the involvement of the community and government, including aspects of taxation [4]. Addressing climate change issues also requires international cooperation. The collaboration arises because of the need for mutual need among the parties involved [5].

One form of international interaction in handling climate change is global carbon trading. The existence of global carbon trading opens opportunities for Indonesia to contribute to achieving carbon

emission reduction targets [1]. In addition, Indonesia is involved in global agreements in the Kyoto Protocol. This effort has been seen through ratification of the Kyoto Protocol to the United Nations Framework Convention on Climate Change with Law 17/2004. One mechanism regulated in the Kyoto Protocol is the utilization of the Carbon Emission Crediting System through the Clean Development Mechanism (CDM) to reduce greenhouse gas emissions that cause climate change [6].

Based on the description described, the purpose of this study is to explain the potential of carbon trading and geothermal development efforts. The study was conducted with a focus on investment ease policy through the provision of tax incentives associated with carbon trading to encourage geothermal development in Indonesia. Furthermore, this study describes tax incentive policies related to Emission Crediting System or Baseline-and-Crediting System in order to encourage the utilization of geothermal energy for electricity generation. Through this study/analysis, it can be known that the provision of tax incentive policies with the Emission Crediting System can support geothermal development.

2. Methods of research

This research used qualitative approach with descriptive method. The data was obtained through literature study (secondary data).

3. Results and discussion

3.1. Emission crediting system and geothermal development

Emission Crediting System (baseline-and-crediting system) is a carbon market where the commodity used is called carbon credit. In this system, a carbon credit is the result of the certification of emission reduction due to project implementation. Thus, the traded commodity obtained after the end of a period or ex-post. One unit of carbon credit is usually equivalent to reducing emissions of one ton of carbon dioxide. In this type of market, emission reduction is the difference from the emissions scenario without the existence of activities/projects to reduce emissions (baseline) with actual emissions after the project [7].

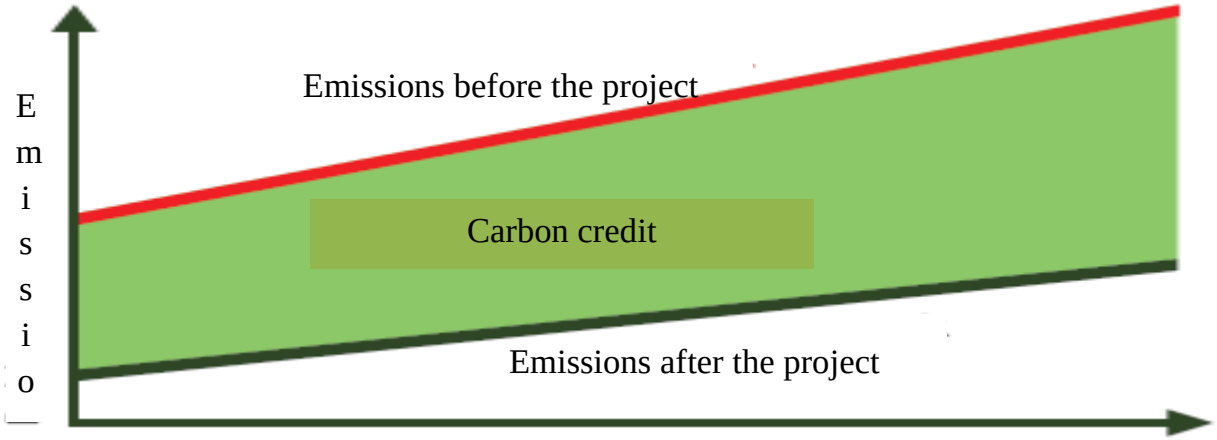

Figure 1. Crediting system illustration
Source: The National Council on Climate Change, 2013 [7]

Credit generated from a project can be sold and used by buyers to meet emission reduction targets. These carbon credits can reduce or offset carbon emissions resulting from buyer activity to achieve neutral carbon or zero emission [7].

One of the market mechanisms in the Kyoto protocol that included in the crediting category is the Clean Development Mechanism (CDM). CDM is a carbon credit provider mechanism that can be used to fulfill these obligations by involving projects in low greenhouse gas emissions in developing countries. Through the CDM project, developed countries benefit from being able to reduce emissions at prices that are relatively cheaper than those developed in their own countries. In addition,

developing countries as a host of CDM projects benefit from financial assistance, technology transfer, and sustainable development.

The objectives of the CDM mechanism are: (1) Helping developing countries to achieve sustainable development and to contribute to the main objectives of the Climate Change Convention, namely to stabilize the concentration of greenhouse gases in the atmosphere; (2) Helping developed countries to meet their country's emission reduction targets.

CDM has a provision that each project must contribute positively to sustainable development in the host country of the project. This must be stated through approval by the designated body in the country, also referred to as Designated National Authority (DNA). In Indonesia, the role of DNA was carried out by the National Commission on Clean Development Mechanisms (National Commission on CDM). DNA Indonesia tasked with evaluating the benefits of the project for sustainable development in Indonesia based on the criteria established and giving approval for its development as a CDM project in Indonesia.

In 2015, the value of global carbon trading was around the US $ 50 billion. The CDM project has resulted in GHG emission reductions of around 10,097.175 tons of CO2e (offset). Geothermal projects have a great opportunity to obtain recognition as CERs [8].

To ensure that each carbon credit is representingemissions reductions of 1 ton CO_2 equivalent, the MRV system (Measurement / Monitoring, Reporting, Verification) applied by market manager. In the baseline-and-crediting carbon market, the MRV system implemented at the project level. In this system, the number of emissions released by the activity and compared to the baseline, namely the number of hypothetical emissions if the activity is not carried out. Verification is also generally carried out by independent third parties. This system adheres to the concept of additionality. This concept intends to ensure that every project that enters the market really needs additional income from the carbon market.

Geothermal-based electrical energy, a type of renewable energy, has enormous potential to support the reduction of greenhouse gas (GHG) emissions, especially CO_2 (carbon dioxide). GHG emission levels from the geothermal are lower compared to other types of power plants [9].

The largest CO_2 content in coal is 990, followed by oil and gas at 839 and 540 kg per MWh, while geothermal is only 0.48 kg per MWh. Likewise, the largest NOx and SOx content in coal. Even for NOx geothermal is almost zero.

Geothermal energy utilization of 500 megawatts (MW) has the potential to reduce CO_2 carbon emissions by 3-5 million tons per year. In 2001, the International Geothermal Association conducted an analysis of CO_2 emissions in geothermal plants with a total capacity of around 4325 Mwe. The average global CO_2 emissions from geothermal plants are estimated to be less than 100 grams per kWh. Of the 580 MW installed capacity of geothermal plants in Indonesia, the average emission is 69.2 grams per kWh [10].

Geothermal has high competitiveness when given a tax incentive as a reward for the benefits of emission reduction. For comparison, the variable costs of various power plants in 2012 based on PLN's plan. The lowest energy costs are still hydropower followed by coal power plants, and Geothermal Plant, while the highest energy costs are at coal power plant. Compared to other types of power plants, geothermal energy costs are estimated to be lower than that of coal-fired power plants, so they should be attractive to investors. Giving additional geothermal tax incentives will be more attractive to investors because it can reduce the burden of financing the initial capital which is relatively high.

3.2. Tax incentive policy and emission crediting system on the geothermal development

GHG emissions that result in an increase in the risk of climate change are one form of negative externality. Externalities defined as the costs or benefits of market transactions that not reflected in prices. Externalities occur when a person performs actions that have an impact on another person or a group of other people without any compensation so that inefficiencies arise in the allocation of production factors [11].

In order to overcome negative externalities, tax intervention to correct the impact of externalities is needed[4]. Tax intervention will produce optimal social benefits through the provision of incentives/facilities, such as tax allowance or import duty exemptions to attract investment in the geothermal industry in order to mitigate climate change.

Providing tax incentives can encourage behavior change towards climate change mitigation through the development of the geothermal industry. Based on regulations in Indonesia, incentive policies can be aimed at projects of renewable energy types, energy savings, have a positive impact on living conditions (economic).

Indonesia provides tax incentives for geothermal development in the form of income tax facilities (tax allowance and tax holiday) and facilities in the framework of imports (import duties, Value Added Tax, and luxury goods tax, income tax on imports). The facility includes payable VAT on the import of goods used for exploration business activities by geothermal businessmen that are borne by the government [12]. However, there is no incentive provision policies related to CDM energy do not yet exist in Indonesia.

The provision of tax incentives by considering the Emission Crediting System allows geothermal investment to grow to meet the electricity needs of the community. One of the advantages of geothermal power plants is low emissions so that it is possible to obtain a CER certificate.

CDM incentive contributions are able to improve the economic factor of the geothermal power plant to support the development of geothermal energy as one of the mechanisms for global climate change management [13]. If every ton of CO_2 priced between 5 and 10 US dollars, with CO_2 emission reduction every year, the geothermal power plant has the potential to get CDM incentives of almost 3.5 to 7.0 million US dollars annually or 100 to 200 million US dollars during production contract period (30 years).

In 2013, the utilization of geothermal energy for power plants contributed to fossil energy savings that occurred with the geothermal power plant as much as 5.7 million barrels of oil equivalent (SBM) and the reduction in emissions in 2010-2013 amounting to 28.5 million tons of CO_2. Referring to US $ 6.5 per ton of CO_2 [14], the reduction in emissions in 2010-2013 was valued at US $ 185,250,000 or at an exchange rate of US $ 1 = Rp10,000 worth Rp1.85 trillion. This can be an indication that the additional benefits of the existence of the geothermal industry in 2010-2013 amounted to Rp1.85 trillion.

The potential for carbon credit or CDM is a large geothermal energy business. The benefits obtained from emission credits are estimated at the US $ 2 billion per year in 2020. It can be assumed that the value of emission credits is the US $ 100 per ton of carbon by 2020 [2].

The existence of a geothermal power plant is proven to be able to provide significant benefits for the welfare of the community in the form of the addition of electrical energy while protecting the environment. With excellence in the geothermal industry, Indonesia can encourage geothermal investment through additional incentives that can be given.

Tax incentives provided do not take into account the potential benefits of CDM for the community [10]. Geothermal tax incentives can be directed towards supporting the CDM methodology (obtaining CERs), encouraging more affordable mechanisms/simpler requirements and reducing the occurrence of transaction costs. The types of tax incentives that are relevant to the acquisition of CER include provision of equipment/technology/material tax allowances and import duty exemptions on the import of equipment/technology/materials that support/relate to the implementation of the CDM scheme in order to obtain Certified Emission Reduction (CER).

The use of CER as a reference in providing geothermal tax incentives can increase the strategic value of geothermal development so as to allow the expansion/addition of tax incentives that will attract more geothermal industry investors. Additional incentives provided in the framework of technology transfer/import of equipment that supports the acquisition of CERs will benefit the Indonesian economy.

The provision of additional tax incentives is important for the government so that the geothermal industry is increasingly motivated to obtain CER certificates. Government support can be given in the

form of providing tax incentives to equipment/various aspects that support the acquisition of a CER certificate of a geothermal industry. It is important to provide these incentives that can support national economic actors to obtain CERs. Some of the benefits of selling CERs include: increasing the country's foreign exchange because CER certificates will be purchased by other countries (government or private sector), can be used to improve community welfare such as reforestation or community empowerment programs around geothermal locations. The provision of tax incentives for the geothermal industry is not only merely supporting carbon trading but is a green investment and low emissions development.

4. Conclusion

The results showed that tax incentive policy related to Emission Crediting System, to encourage the geothermal energy development for power plant currently is not optimal. Utilization of geothermal power for generators reduces CO_2 emission and saves fossil energy. Geothermal development supports mitigation on climate change by reducing the GHG emission. Providing tax incentives by considering Emission Crediting System allows geothermal investments to grow to meet the electricity needs for the people, to help developing countries to achieve sustainable development and to contribute to stabilizing the concentration of greenhouse gases in the atmosphere.

Law 17/2004 provides a foundation for geothermal incentive policies with consideration of the CDM mechanism. The provision of additional geothermal tax incentives can be directed to support the implementation of the CDM scheme to obtain Certified Emission Reduction (CER). The types of tax incentives that are relevant to CER acquisition include: giving tax allowances and import duty exemptions. In addition, the implementation of a consistent and transparent geothermal tax incentive policy will increase public and investor confidence. Utilization of geothermal energy for power plants contributes to the reduction of emissions and fossil energy savings that occur with the existence of a geothermal power plant.

Acknowledgments

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