Proceedings World Geothermal Congress 2020+1
Reykjavik, Iceland, April - October 2021

Community Engagement Support on Sustainable Geothermal Operation: A Perspective on Corporate Social Responsibility Implementation in Indonesia

Eko H. Purwanto[1)], Havidh Nazif[1)], Sentot Yulianugroho[2)], Safiul Primasatya[1)], Ahmad Fathoni[1)]

[1)] Directorate of Geothermal, Ministry of Energy and Mineral Resources, Jl. PegangsaanTimur No. 1, Jakarta

[2)] PT Pertamina Geothermal Energy, Menara Cakrawala 5th floor, Jl. M.H. Thamrin No. 9, Jakarta

email: eko.hari@esdm.go.id

Keywords: Corporate Social Responsibility (CSR), Social Engagement, Community Development, Environment

ABSTRACT

Indonesia regulates that each company that is engaged in natural resources is required to accomplish Corporate Social Responsibility (CSR) activities. Geothermal enterprising activities are vastly known to be an environmentally friendly campaign, which directly have an inseparable significant relationship surrounding community activity. This is supported by the fact that natural resources enterprising has an exploitative characteristic that should be handled cordially in order to avoid social conflicts and achieve successful projects, both environmentally and economically. Each geothermal area in Indonesia has distinctive socio-economic nature from other geothermal areas; what make this topic interesting to study considering that each of the companies engaged in geothermal in Indonesia has different types of enterprising schemes.

This paper aims to provide a review on CSR engagement in geothermal development fields in Indonesia, highlighting specifically several corporate strategies in planning and executing CSR programs in order to embrace social and environmental challenges. Several case studies, both in exploration and exploitation fields are presented to discover the length of the distribution of CSR programs and their relevance to the needs of community. Comparison of annual CSR cost and cost per generation capacity amongst fields is reviewed in order to provide statistical evidence on social handling cost trends. This paper also addresses the need of further regulatory framework as a legal basis to emphasize CSR practice in the Indonesian geothermal industry.

1. INTRODUCTION

1.1 Study background and objective

Geothermal electricity generation is known as one of the most environmentally friendly technology in harnessing electricity. Geothermal enterprising activities is inseparable from interactions with surrounding social community, cultural and environment. This study aims to explain and evaluate social engagement strategy which conducted by geothermal companies in the proximity of their geothermal project area. The importance of addressing community needs and demands are also discussed. Each geothermal company has a different background and also operates on distinctive project locations, which is very site specific, therefore it may affect their approaches and cost allocation that might also diverse from one another. Limited Liability Companies Law Number 40 of 2007 governs that every company which conduct business in the field of natural resources exploitation is required to accomplish CSR activities. However, geothermal industry in Indonesia has yet to have specific and detailed regulations that govern geothermal CSR implementation. This might have an impact on the uneven approach and implementation stage of CSR.

The study also aims to provide cost allocation trend of geothermal CSR in every field that is operated by different company that is entitled to different enterprising mechanisms. This study will describe CSR cost allocation in Indonesia for 5 years span, from 2014 to 2018. Therefore, from costs range available, this study will attempt to provide cost portion that will satisfy of fairness level of CSR. Fairness level, which is obtained from this study, can be utilized as a reference in implementing CSR. Furthermore, this study will assess the comparison between generation capacity, generated revenue, and CSR costs. We hope that this comparison can be use as consideration to decision maker and CSR stakeholder in implementing CSR policy and strategy as one of the strongest tools in accelerating geothermal development in Indonesia.

1.2 Geothermal energy and utilization in Indonesia

Indonesia has abundant geothermal resource. Ministry and Energy and Mineral Resources (MEMR) states that 25,386 MW of resource has been discovered in Indonesia (Geological Agency, 2018). Geothermal resources in Indonesia is located in 349 geothermal prospects that spread along subduction zone along western and southern Indonesia toward northeastern part of the country. Geothermal resources in Indonesia are primarily applied for electricity generation. Total geothermal power plants installation in Indonesia is 1,948.5 MW at the end of 2018 (Table 1). This describes that Indonesia only utilize 7.6% out of geothermal resources available.

Government of Indonesia has established energy policy in form of National Energy Policy (NEP) which encourages renewable energy development in Indonesia. NEP encourages renewable energy utilization in Indonesia, which administer renewable energy mix reaches at the degree of 23% of primary energy in 2025. This policy will support geothermal development to achieve 7,241 MW in 2025. With accordance to this plan, MEMR of Indonesia has established 64 geothermal working areas (GWA) which consists of 19 existing GWA and 45 new GWA. Furthermore, in order to ease geothermal exploration, MEMR has authorized 13 preliminary survey assignment and exploration (PSAE) to geothermal companies to conduct geoscientific survey and exploration drilling in Indonesia.

Table 1: Indonesia geothermal power plants installed capacity as of 2018

No	Geothermal Working Areas	Geothermal Power Plants	Developers	Turbine Units	Installed Capacity (MW)
1	Kamojang Darajat	Kamojang	PT. Pertamina Geothermal Energy	1 x 30 MW 2 x 55 MW 1 x 60MW 1 x 35 MW	235
	Kamojang Darajat (JOC)	Darajat	Star Energy Geothermal Darajat II, Ltd	1 x 55 MW 1 x 94 MW 1 x 121 MW	270
2	Cibeureum Parabakti	Salak	Star Energy Geothermal Salak, Ltd.	3 x 60 MW 3 x 65,6 MW	377
3	Dataran Tinggi Dieng	Dieng	PT. Geo Dipa Energi	1 x 60 MW	60
4	Sibayak Sinabung	Sibayak	PT. Pertamina Geothermal Energy	1 x 10 MW (monoblok) 2 MW	12
5	Pangalengan (JOC)	WayangWindu	Star Energy Geothermal WayangWindu Ltd.	1 x 110 MW 1 x 117 MW	227
	Pangalengan (Patuha Area),	Patuha	PT Geo Dipa Energi	1 x 55 MW	55
6	Lahendong Tompaso	Lahendong	PT. Pertamina Geothermal Energy	6 x 20 MW	120
7	Waypanas	Ulubelu	PT. Pertamina Geothermal Energy	4x 55 MW	220
8	Ulumbu	Ulumbu	PT. PLN (Persero)	4 x 2,5 MW	10
9	Mataloko	Mataloko	PT. PLN (Persero)	1 x 2,5 MW	2,5
10	Sibual Buali	Sarulla	Sarulla Operations Ltd.	3 x 110 MW	330
11	Karaha-Cakrabuana	Karaha	PT. Pertamina Geothermal Energy	1 x 30 MW	30
		TOTAL		**39 Unit**	**1.948,5**

Accelerating geothermal development is a vast challenge that needs to be resolved in a short amount of time. The integrated and comprehensive CSR approach is one of the non-technical solutions that need to be considered by stakeholder in geothermal acceleration. Community engagement is very essential in supporting renewable energy imaging and enhance positive public perceptions of geothermal development. This may help geothermal company in gaining social acceptance in regards to geothermal electricity generation at the particular project.

2. SOCIAL ACCEPTANCE OF GEOTHERMAL DEVELOPMENT

Public acceptance varies in different projects and throughout enterprising phase. The acceptance of people in geothermal areas with a modernized society is generally higher and increases along with economic and technology growth. Based on the author's observation, the low level of public acceptance in the exploration phase possibly due to people's lack of knowledge in the early phase of geothermal exploration. This also inferred that social benefit that is provided by geothermal projects during exploration stage is minimal. Conversely, geothermal positive impact recognition from local community increases as the project phase move toward development, construction and finally attain highest acceptance in operation phase (Figure 1).

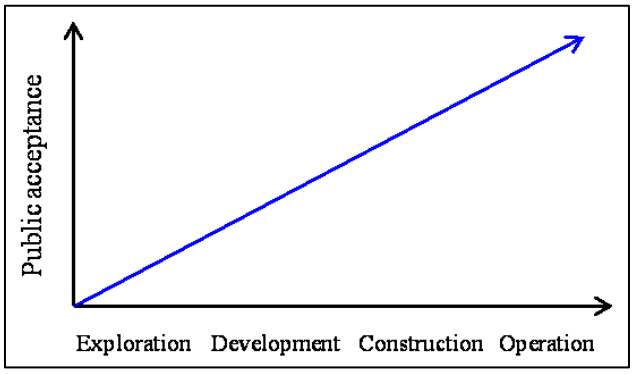

Figure 1: Social acceptance level in geothermal development phase (author's analysis)

Community acceptance will then influence the social approach strategy that is going to be carried out by the company. The approach that will be used is mainly addressing issues such as economic condition, employment, land use, level of education, social-cultural, and religion. MEMR implements mitigation efforts in preparing GWA at the phase prior to GWA tender. This is conducted to provide semi-detailed preliminary information and assessment on social, economic, and cultural conditions before exploration activities are carried out. Directorate of Geothermal, MEMR conduct socialization to local community and local government with aims to provide general information and advantages of geothermal development in each geothermal project. This activity can assist to increase awareness and acceptance level of geothermal activities.

3. THEORY OF CSR

Ismail (2009) explains that CSR represents corporate strategies to organize their business activity ethically, cordially, and accommodates benefits to the community in terms of development. CSR activities shall encompasses three entities i.e. community, corporate and governments to accomplish successful achievement. Community development (CD) is a program that referring to community-organized initiatives which implemented through partnerships by involving external organizations or corporations. CD is carried out with the aim of empowering individuals or sets of people by offering the skills needed to stimulate positive changes in their own communities. CD involves combined process of programs, strategies and activity that stimulate the economic development through local potential.

According to Ismail (2009), CSR has significant role in CD by providing direct and indirect benefits to the society through corporate social commitment. Several roles of CSR in CD can be summarized as follows: share negative costs of industrialization, strengthen relationship between company and community, optimizing local potential, capacity building by transfer of knowledge, enhance environmental protection, data statistics gathering purpose, poverty alleviation/mitigation program, and support internal corporate sustainability goals.

According to Mangoting (2007) and Hill et al (2007), CSR increase cooperation with stakeholder which in return giving long term positive economic influences on corporation. This claim is supported by study that conducted to several companies in the United States, Europe and Asia. The result show that the company that implement CSR experience gradual growth of stock value in 10 years compared to those who do not carry out CSR.

4. CSR OF GEOTHERMAL ENTERPRISING IN INDONESIAN REGULATORY FRAMEWORK

In practicing geothermal projects, project's initiator is required by national and international regulations to avoid social unrest and environmental damage. Article 74 Limited Liability Companies Law Number 40 of 2007 states that every companies which conducts enterprising in/or related to natural resources are required to carried out Environmental and Social Responsibility (ESR). In carrying out ESR, company are encouraged to use costs by paying attention to propriety and fairness. ESR represents company's commitment to be part of sustainable economic development with aims to enhance the quality of life and environment, which will be beneficial for the company, local community and society in general. Additionally, Article 15 Investment Law Number 25 of 2007 regulates that every investor shall have obligation to implement CSR.

The concern of ESR is further regulated by Article 4 and 5 of Government Regulation Number 47 of 2012 concerning ESR. The Government administrates that corporate annual Work Program and Budget (WP&B) must include activity plan and budget that is required to carry out corporate ESR. Specifically for geothermal enterprising, CSR is regulated by Geothermal Law Number 21 of 2014 and Article 97 of Government Regulation Number 7 of 2017 concerning Geothermal for Indirect Use regulates that Geothermal Business Permit (GBP) holder must arrange local Community Development and Empowerment Program. This program shall be taking into account proposal which proposed by local society through regional government. This program is prioritized for society that exposed to direct impact of geothermal enterprising. Cost allocation of this program shall be part of annual work program and budget which managed by GBP holder.

The author divides the CSR strategy in GWA in Indonesia based on a combination of types of enterprising and company share ownership (national and foreign). The author believes that share ownership of company may affect the strategy of implementing CSR in their respective areas.

In this study, the evaluation of CSR implementation is divided into 3 categories, namely:

1. Joint Operation Contract (JOC) which involves an operational contract between subsidiary of State Owned Company/SOE (PT Pertamina Geothermal Energy/PGE) and JOC contractors. This scheme involves foreign business entity as JOC contractors.
2. SOE company which some or entire assets are owned and managed by Government. In this study, PT PGE as a subsidiary of PT Pertamina (Persero) is categorized into this classification. This category also applies to PT Perusahaan Listrik Negara (PLN) and PT Geo Dipa Energy (GDE). These companies manage geothermal enterprising by using concession authority and or assignment which issued by MEMR.
3. Foreign Investment Company (FIC) which is a business entity that is formed in Indonesia but shares foreign ownership. This company carries out geothermal enterprising as a GBP holder.

5. SCOPE OF ANALYSIS AND METHOD OF ASSESMENT

This study is performs evaluation on 14 geothermal fields which are managed by different type of company. This study measures CSR activities carried out by each company. Quantitative method is used in studies by combining comparative-descriptive methods in observing, describing and comparing each company's strategy in implementing CSR. Moreover statistical analysis is conducted with the aims to measure the degree or association between installed capacity, revenue generation, and CSR cost. Data set which are utilized in this study are installed capacity, generation revenue, CSR activities, and CSR costs which obtained company work program and budget during 2014 to 2018 and plan for 2019. This assessment also use exchange rates conversion annual revised National Budget (APBN-P).

6. RESULT AND DISCUSSION

6.1 CSR strategies carried out by geothermal company in Indonesia

6.1.1 Joint Operation Contracts

Star Energy Geothermal Darajat Ltd. (SEGD) and Star Energy Geothermal Salak Ltd. (SEGS) established their planning and implementation framework through sets of flowchart as seen in Figure 2. According to Mulia (2019), loop process involves stakeholder request, stakeholder meeting, social mapping, budget planning, program implementation and annual reporting. In 2019, update on social mapping explains that the most issues that require further concerns are economy, education and unemployment issues which accounts up to 80% of the results. These issues encourage Star Energy to mainly focus on economic development, education and environment.

Based on our analysis, during 2014 to 2018, Darajat geothermal field cost allocations are mainly utilized as much as up to 28% for economic development such as PRISMA Program (promoting integrated and sustainable economic development) through small medium enterprise and by providing electricity connection to rural areas as known by DESA CAANG program, conducts vocational training and youth development support. The other significant role accounts for environmental program which costs up to 45% of annual budgets. SEGD implements forestry collaboration to support conservation forest area, biodiversity program and involves in coffee plantation program. For Salak geothermal field, up to 55% of annual budget are dedicated for Salak Green Corridor Program as part of collaboration with Gunung Halimun Salak National Park to increase quality and preserve ecosystem of conservation area. Whereas other cost allocation are aim for education program namely scholarship and improve public school facilities. Green Corridor Initiatives has been an exemplary for environmental-based geothermal development management in National Park.

The most important factors which driven SEGD and SEGS in planning and implementing CSR and CD programs in Salak and Darajat field are social mapping results, generated revenue and corporate compliance to regulation (Bagus K. Tandia, Star Energy, personal communication, July 2019). Based on annual evaluation, CSR implementations in these fields regularly reach at least 80% of initial plan. Nature of foreign shareholders may influence the height of Darajat, Salak and Wayang Windu CSR allocation.

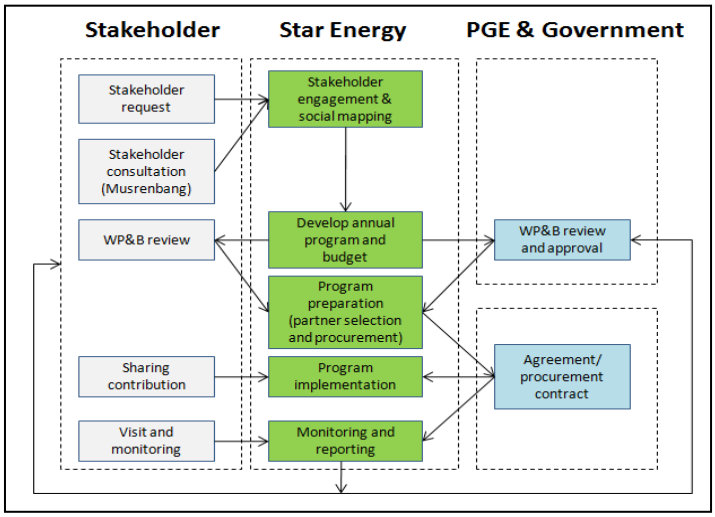

Figure 2: Star Energy CSR planning flowchart (modified from Mulia, 2019)

6.1.2 State Owned Enterprises

For SOE discussions, PGE is used as an example given the large number of operating fields. PGE has implement CSR and CD by using their own fund with an additional fund from Pertamina (Persero), their corporate holding company. Prior to project implementation, PGE defined scope of CSR and CD context by conducting social mapping and stakeholder analysis (Figure 3). Social mapping results are updated regularly every 3 years. Evaluations are regularly implemented by conducted community satisfaction measurements whereas reports are periodically submitted both internally through monthly, quaternary, and annual report as well as external publication.

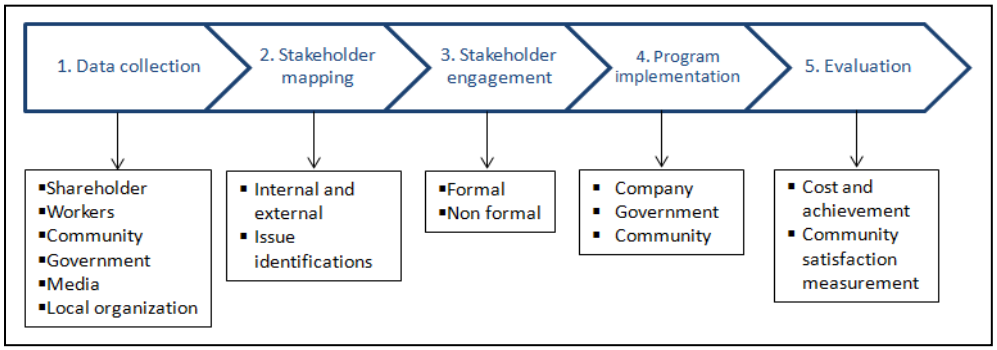

Figure 3: Planning and implementation of PGE CSR and CD program (modified from PGE, 2019)

CSR planning starts with the demand assessment and proposal submission from community under the coordination of the Regional Government, for through Regional Planning and Development Forum (Musrenbang), Forum Group Discussion, or in the form of Social Mapping needed in order to develop a Strategic Plan and Work Plan for implementing CSR. After the preparation of Strategic Plan and Work Plan, the program implementation is managed in accordance with the capacity of the company while still consider the independence of the community to proceed to next stage (exit strategy). PGE mostly handles CSR and CD independently, however there are several activities that requires certain expertise or should be carried out by coordinating with Government, which in this case Ministry of Forestry and Environmental, for example Javanese Eagle conservation activity.

PGE prioritize CSR and CD based on local community demands or needs which already encapsulated by social mapping. Intensity of PGE in conducting CSR is also guided by demand from lenders and corporate holding as the driving factors. PGE divides their CSR and CD approach by 5 categories, i.e.: education, health, environment, economic development and infrastructure. These criteria implementation which accounts most cost allocation can be summarized as follow:

1. For Kamojang area during 2014-2018, our evaluation indicates that most geothermal CSR and CD budgets are allocated for infrastructure (35-68%) mainly for road upgrading, clean water facilities, and mosque renovation. The second most dominant activities which account 20-35% of budget annually are for environmental activities such as Javanese Eagle conservation, land rehabilitation and plant nursery.
2. For Lahendong, CSR and CD budgets are allocated for economic development (33-80%) mainly for organic composting, handcrafting, brown sugar farming group, cattle farm and fish breeding. The second most dominant activities which account 5-27% of budget annually are for infrastructure such as village hall upgrade and electricity connection support.
3. For Ulubelu the most dominant cost allocations are for economic development which spends up to 59%. PGE Ulubelu has successfully stimulates economic development through participation of cattle farming, fish farming and bread small medium enterprises (SME). Whereas in Karaha, the most allocated budget usually utilized for infrastructure and social activities participation in the form of road upgrading, youth activity participation and mosque renovation where it consumes up to 65%.

CSR implementation result reflects on good management and accurate social mapping which can help community toward economic independency, thus providing positive atmosphere for the company's business activities. Until now, Kamojang has been operated for 36 years and managing geothermal activities in harmony with the community and has participated in the development of community empowerment, including encouraging the birth of a local hero in empowering local communities.

6.1.3 Foreign Investment Company

For this type of enterprising, Supreme Energy fields are used in this comparative study. Supreme Energy Corporation consists of a joint Indonesian company with several foreign investors which involved as shareholders. PT Supreme Energy Muara Laboh (SEML) is currently constructing geothermal power plant at GWA Muaralaboh, PT Supreme Energy Rantau Dedap (SERD) is carrying out power plant construction in the Rantau Dedap field, and PT Supreme Energy Rajabasa which until now is still in the stage of completing the exploration. For the CSR and CD approach, they divided their social engagement plan by focusing on 5 categories namely: Economic Development, Improving Infrastructure, Education and Health, Social Activities, and Environmental.

The most important factors which driven SEML, SERD and SERB in planning and implementing CSR and CD programs in their fields are corporate commitment to regulations compliance and community, shareholder and corporate requirements, and to enhance corporate images (Erwin P. Floris, Supreme Energy, personal communication, July 2019). One of the highest cost allocations in Muaralaboh is targeting to improve economic development through several activities from 2015 to 2018 which consists of fish breeding, macadamia peanut planting, micro financing for SME. Other highest cost allocations are for participation on mosque construction and city welcome entrance construction. As for Rantau Dedap field, the highest cost allocation of CSR and CD are dedicated for improving education and health facilities.

6.2 CSR costs

Annual costs which evaluated from 14 geothermal fields, which consists of 11 existing operating fields, 2 construction fields and 1 exploration area and it provides statistic results as seen in Table 2. We calculate the average of CSR cost by taking into account each annual spending in 2014 to 2018. Whereas for annual CSR costs/ MW are calculated by taking into account each fields annual incremental capacity instead of their 2018 capacity, therefore this can give us insight of average annual cost in the particular year. This analysis is carried out with the notion that the greater the generation capacity that is operated, the greater the revenue earned. Therefore company has larger obligation or proportionality to provide greater feedback to the society. The calculations notify that average annual CSR cost/ MW are about 1,500 USD/MW.

The study also informs that during 2014 to 2018, more than 19.8 million USD in total is contributed by geothermal companies to social and environmental causes, for not only to fulfill regulations compliance but also in order to achieve sustainable geothermal development. From our evaluation, this study suggests that annual CSR cost for geothermal development is about 224,569 USD. This number can be divided by 2 categories average CSR cost for operation phase is about 262,514 USD and average CSR cost for exploration, development and construction phases is about 85,438 USD.

This study also measures ratio of CSR cost over generated revenue. This actually calculated in order to achieve correlation between electricity generation and CSR cost. However this study can not find specific relation, where we conclude that most of geothermal companies mostly account social demands and social mapping results as most important factors in budgeting their CSR expenses other than using generation capacity or revenue generated as variable that can affect CSR cost. Based on our evaluation, the average ratio of CSR cost compare to generation revenue is approximately at 0.34%. This valuation is calculated by leave out ratio from Sibayak field, which was not operationally continuous due to turbine damages from 2013 and other currently exploration and construction fields in Muaralaboh, Rantau Dedap and Rajabasa. The comparison and ranks of average annual CSR costs from each field can be seen in Figure 4.

Table 2: Comparison of geothermal CSR cost during 2014 to 2018

No	Area	Total capacity by 2018 (MW)	Company	Average annual CSR cost (USD)/MW	Ratio CSR (USD)/ Revenue (USD)	Average Annual CSR cost (USD)
1	Kamojang	235	PGE	1,050	0.20%	261,904
2	Lahendong	120	PGE	2,037	0.50%	204,490
3	Sibayak	12	PGE	956	N/A	11,640
4	Ulubelu	220	PGE	354	0.10%	58,241
5	Karaha	30	PGE	472	0.08%	37,592
6	Darajat	270	JOC PGE - SEGD	3,052	0.62%	836,800
7	Salak	377	JOC PGE - SEGS	2,109	0.40%	794,000
8	Wayang Windu	227	JOC PGE - SEGWWL	1,680	0.28%	392,305
9	Sarulla	330	JOC PGE - SOL	534	0.11%	55,671
10	Dieng	60	GDE	1,407	0.54%	87,974
11	Patuha	55	GDE	2,894	0.57%	147,032
12	Muaralaboh	0	SEML	N/A	N/A	116,904
13	Rantau Dedap	0	SERD	N/A	N/A	65,429
14	Rajabasa	0	SERB	N/A	N/A	73,980

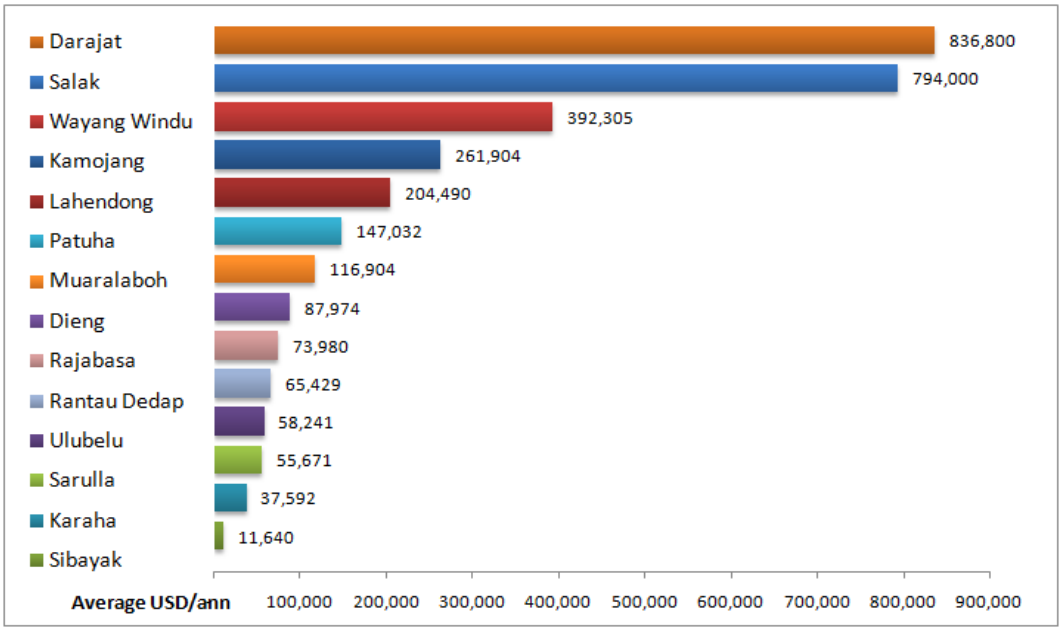

Figure 4: Average annual CSR cost from 2014 to 2018

7. FURTHER STUDY

Several issues that arise during study and require further examination are as follows:

1. Quality level of community acceptance in geothermal projects and the effectiveness of community development achievement after a CSR program is completed need to be evaluated further, if possible through monitoring and evaluation methods an or through direct surveys to the community.
2. MEMR has yet specifically regulated geothermal CSR and CD, therefore this study can offer consideration from the fairness of the costs and types of activities that can be carried out in CSR and CD. Several other issues that should be accommodated in CSR and CD regulation draft are:
    a. Organizational structure that handles CSR and CD should be required in geothermal company.
    b. Social mapping with aims of evaluating the need of community.
    c. Types of activity which can to be covered by CSR and CD should include economic development, health, education, employment, social and cultural, and infrastructure involvement.
    d. Measurement of achievement indicators.
    e. Periodic reporting to Central and Regional government.

3. Further discussion should be carried out among stakeholder regarding phase of geothermal activities that require CSR activities to be carried out, given ongoing debate in geothermal industry that during exploration stage, CSR activities are not compulsory.
4. Further comparison between geothermal and other energy commodity such as oil and gas, mining and other renewable energy should be carried out with aims to obtain insight on the existence of geothermal CSR compared to other energy sources.

8. CONCLUSION

In general, geothermal companies in Indonesia conduct social mapping and stakeholder analysis prior to planning and implementing CSR and CD activities. Almost all of geothermal company divided their main implementation into 5 categories, i.e.: education, health, environment, economic development and infrastructure. Most of geothermal companies update their social mapping results and conduct monitoring and evaluation as well as community satisfaction index to measure their achievement. The successfulness of geothermal CSR and CD implementation in Indonesia is measured both quantitatively and qualitatively. The community serenity can be observed by the continuance of economic development programs, increasing education levels, local employment, improved infrastructure and good corporate-community relations at project site. This socially and environmentally acceptable CSR approaches therefore can assist sustainability of geothermal development and operation.

This paper provides comparison of annual CSR cost and cost per generation capacity (MW) amongst fields in order to provide statistical evidence on social handling cost trends in Geothermal Industry in Indonesia. This study suggests that annual average cost is about 224,569 USD. This magnitude is highly affected by annual costs which were utilized by Star Energy geothermal fields, which ranges 392,000 to 896,000 annually. The cost of CSR is higher in the operation stage compare to exploration, development and construction. This is likely to be influenced by the increase of annual costs which is due to increasing income. This study also informs that average annual CSR cost/ MW are about 1,500 USD/MW. However this study could not find a general agreement which can prove that annual CSR cost is changing linearly as the generation capacity increased and revenue escalating. Therefore we conclude that CSR and CD budget should be highly with regard to social mapping result and community demands instead of generation capacity or revenue. Nonetheless this study explains that the average ratio between CSR cost compare to generation revenue is approximately at the magnitude of 0.34%. This percentage can be use for least cost reference of cost fairness in implementing CSR during operation stage.

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