Geothermal as the solution for indonesia’s electricity shortage

Business, Accounting

Geothermal as the Solution for Indonesia’s Electricity Shortage: How does Indonesia’s Political Condition and Policies affecting it? Introduction The current condition arises within Indonesia is the electricity shortage. This can be seen as numbers of black outs happens in every part of Indonesia’s region of which conducted due to save the electricity reserves. Such problems happen because as an abundance country in which very rich with natural resources, including the source of potential energies that can be generated as electricity, Indonesia’s electricity production concentrates more on the conventional thermal sources—oil, natural gas and coal. By looking at the world reserves of these conventional thermal sources, Indonesia’s oil reserve is only 0. 6 percents from total world reserve, Indonesia’s gas reserve is only 1. percents and coal reserve is only around 3. 1 percents from the total world reserve. Thus, we cannot say that Indonesia is poor in fossil fuel energy, indeed.

However, we are very far than rich of it. But then, the cliche condition is that we put fossil fuel as a primary resource to produce electricity (look at Table 1 and Table 2). Malla (1993) stated that the fossil fuels provide at least 59% of total energy consumption in 1974 to 63% in 1992 (excluding Vietnam). This dependence on fossil fuels is greatest in relatively more developed economies (based on country’s per capita GDP) in South East Asia (SEA) such as Brunei, Indonesia, Malaysia, Singapore, and Thailand, where over 80% of all energy needs for power generation in 1992 are provided by fossil fuels, compared with about 45% in less developed economies (for e. g. , Myanmar, Philippines, and Vietnam).

And that is what has leaded us to electricity shortage today[1]. Moreover he also stressed out that among the type of fossil-fuel intensities; Indonesia has the highest average oil intensity during the period of 1983-92. Though later Indonesia then makes a generation-mix of fossil-fuel with coal and natural gas (look at Figure 1) as Indonesia's production on oil decreases in the following year (Figure 2), still the portion oil intensity in producing electricity is still high. Moreover, according to Tumiwa (2008) oil is no longer dominate primary energy supply but it share still consider high and likely to continue in the next few decade and will still be an issues for Indonesia's energy insecurity.

Based on the Energy Infomation Administration report (2007), during 2004, Indonesia generated 112. billion kilowatt-hours (Bkwh) of electricity, of which 86 percent came from conventional thermal sources (oil, natural gas, and coal), 8 percent from hydroelectric sources, and 5 percent from geothermal and other renewable sources. In addition, even with such mix of fossil-fuel with coal and natural gas (or known as the conventional thermal resources) Indonesia will still face the electricity shortage if we put a lot of portion to these sources as they are also limited, look at Table 3. Tumiwa (2008) stressed that to Indonesia, the renewable sources is the one that offer huge potentials to solve its problem of electricity shortage or insecurity.

One of them is Geothermal. Thus, this paper will analyze more of this sources and assessing whether how does this situation viewed by the investors: Is there a business opportunity there? Though its is unlikely possible for a government to open entire this market, as it will contradict to

the Indonesia’s legislation, but is there a business opportunity possibilities opens in form of partnerships for example that being stresses in this paper. And how does Indonesia’s political situations through its policies associated with geothermal development to create possible business opportunity for investors to take part in Indonesia’s geothermal development? The organization of this paper is as follows. The next part will be the choice of alternative energy, the reasons and the problems related to it, especially for the investors or business players. The third part will be about the Indonesia’s political situation associated with its policies relate to Indonesia’s geothermal developments. The last part will be the conclusion. Geothermal as an Alternative Energy in solving Indonesia Energy Shortage As mentioned before, according to Tumiwa (2008) geothermal is one of the renewable sources in which it can solve the problem of electricity shortage or insecurity in the future. She said geothermal is a solution as just by looking at its potential can be reached up to 100, 000 MW in addition to current potential sources, if medium and low temperature geothermal is counted.

Moreover, the hottest geothermal regions are in the regions in which the majority of the world’s active volcanoes above sea level concentrated –i. e. Ring of Fire, in which it includes Indonesia (Secondary Infobook, 2008; Advameg, Inc. , 2009) Overall, according to Geothermal Education Office (GEO) (1997) with such great subduction plate boundary 4000 km long between the Eurasian and Australian plates has formed nearly 200 volcanoes, Indonesia has able to generate 100 geothermal fields. However, the geothermal development in Indonesia concentrates mostly in Sumatra,

Java-Bali and North Sulawesi as these areas have appropriate infrastructure and until recently have had rapid growth of electricity demand.

Global Energy Network Institute (2009) stated that the total reserve of about 9, 100 MWe is defined by the summation of proven (2, 000 MWe), probable (600 MWe) and possible (6, 500 MWe) potential for fields distributed in Sumatra, Java-Bali, Sulawesi and other islands drilled for electricity generation purposes. Unfortunately, the usage of geothermal as a power plant has been very little while the potency is still very large. Based on the Ministry of Energy and Mineral Resources (MEMR) statistics indicate that renewable energy utilization (hydropower, geothermal and biomass) accounts for only 3.

4% of total potential reserves. Even though the growth of electricity demand has been high enough to drive renewable energy development, but the geothermal consumption is very low—i. e. accounting for only one percent, or about 7.

7 million barrels of oil equivalent (BOE), out of a total 574. 6 million BOE consumed in 1999. According to Gupta (2009) such condition happens because, the exploitation and exploration of geothermal itself associated with high risk and capital intensive nature of the projects. Moreover, according to him, the exploration phase for a geothermal power plant comprises the highest cost and has a success rate of just about 25 percent compared to 45 percent for oil exploration. And it is caused by low technology development in Indonesia that later becomes a prior barrier to

this project, reducing the competitiveness of the geothermal projects compared to other energy exploration (i.

. oil and gas) in which have enjoyed high subsidies for years. However, in the long term compared to other energy, geothermal is relatively economical in the long term though at the beginning of its implementation and its development it has higher cost as mentioned before. It happens because is also bound low carbon emissions in which it has becomes the major concern of the global environment today and in the future. Based on this, Gupta (2009) stated that this has been the supporting factor that increases the financial attractiveness of the projects. It is then the government responsibility to make this financial attractiveness of geothermal development able to maintain as it will solve most of its issues relate to technological barrier and high capital investment needed. Moreover, US Embassy (2002) pointed out three factors in which causing Indonesia’s lagging in its geothermal resource development as follows: • Commercial development of geothermal energy requires electrical power plant development onsite. As a result, this requirement may limit the resource to a small local market or one not well connected to a larger load center.

Development requires high initial capital costs, including initial exploration and the commitment to purchase a large portion of the eventual fuel supply at start-up in the form of development wells. Long term operating costs, however, are quite low. Thus, geothermal contracts require base load status and long term price security in order to justify development.

• Several significant benefits of geothermal development are not effectively represented in the valuation of the electricity. These benefits include the long-term low cost operation, contributions to preserving the environment, and the resultant diversification of supply with an indigenous, distributed resource Associated with the risks mentioned by Gupta (2009) relates to Geothermal projects, according to Deloitte Department of Energy Development (2008) aside from those high cost at the beginning of its project development is not only its significant upfront costs but also in determining the viability of the resource basin. Moreover, list of risks based on the likelihood of occurrence and the perceived impact on the investment project associated with geothermal project development can be seen in Table 4. Based on the risks that cannot be realistically avoided and have the reputation of increasing the cost of capital or raising the required rate of return, in the case of a geothermal investment, the likelihood of drilling a dry hole might carry a high probability and consequently put the project at a higher risk. As in Indonesia’s Constitutional the important commodity in which it is essential to the lives of the populace, should remain under the government’s control, thus in order to asses the whether there is business opportunity relies in this projects or not (from the investors or business players point of view) thus government policies relate to this sectors becomes important.

Government Policies in Indonesia’s Geothermal Development Since September 2002 in which Law No. 0 of 2002 on Electricity was passed by the Indonesian Parliament to replace the previous Electricity Law—Law No. 15 of

1985—and, to introduce more competition into the market as form of magnification of the Indonesian government toward the development of geothermal resources as future energy solution to Indonesia’s electricity shortage there has been several up and down to this law. For example, in December 2004, the Constitutional Court annulled this law, and reinstated the outdated Electricity Law, No. 5 of 1985, because the previous law passed on September 2002 has been a contrast actions and preposition to the 33 of Indonesia’s 1945 Constitution in which it basically stressed out that the important commodity of which it is essential to the lives of the populace, should remain under the government’s control. And as electricity is considered to one of those sectors that need to be controlled by the state thus by opening competition to business players or foreign participation is considered to lessen the benefit to the people. This political consistency thus has made the financial attractiveness mentioned before by Gupta (2009) becomes lowered too as it is not being supported by the political condition in Indonesia itself. Thus political situation in which it is not persistent has later affecting the policies associated in how should the development in geothermal energy conducted.

Both now-defunct new law of 2002 and the old law of 1985 basically divide the activities of the electric power industry into electricity supply activities and electricity support activities. Under the old, and current, law of 1985, electricity supply activities are organized by the government and carried out by state owned companies, known as “ BUMN”, established as the holders of the so-called Electricity Undertaking Authorization, i. e. state-owned

companies assigned the sole task of providing electricity for public use authorized by the government), whereas electricity support activities may also be undertaken by the Government in cooperation with private business entities. Unbundling respect to the manner of how electricity supply ctivities and opening up the electricity industry to international investment were to be organized was basically the main intention of 2002 law in which that differentiates the old law with the 2002 law. Rakhmat, et al. , (2005) explains that with the unbundling system, electricity supply activities will be performed separately by multiple different business entities.

Operation of electricity power plants would be open to free competition among business entities, regardless of whether such entities were state-owned or privately-owned. Furthermore, the Government had hoped that with this kind of structure, foreign investors would participate in providing electricity supply which, in turn, would create a fair and competitive market yielding the best products for the lowest prices. However, this concept was perceived as a threat to state owned companies because private companies are in better position to compete in the market, having available better management, technology, and finance. Then by opening up this project of development to the business players or investors, it will result the uncertainty in the provision of sufficient electric power to all layers of society and all parts of the archipelago. The major consideration was that, private companies are likely to concentrate on providing electricity to the big cities rather than the remote areas as this had already happened before in the early 1990’s (Rakhmat, et al.

, 2005). However, though the new law has been annulled, but then the Constitutional Court has stated that private business entities, both national and foreign, may cooperate with state owned companies in supplying and generating power for the public by providing financing or by setting up joint venture Indonesian companies, with state-owned companies taking a majority position. The annulment was purposed to eliminate the possibility of uncertain condition to the Indonesian people.

Such clear proposition should be created in order to make the future business environment in the development of Indonesia’s geothermal projects becomes stable as if otherwise then the financial attractiveness offered by his projects will be lessen. And as Indonesia’s technology development still behind, thus it will then burden the government and at the end, the people will be at disadvantage. This development will not only causing lower long-run cost to the government and the people, lower Carbon emissions, but also higher net present value as there is not no cost of fuel in which based on this, business opportunity is ertainly possible but with the stable and assurance to the Indonesia’s political condition represented in its policy toward this project. As comparison, in case of USA, its government gives a 1.

9 cent subsidy per Kwh, owing to Production tax credit (PTC) for renewable energy makes the projects financially attractive. While the primary driver for a surge in geothermal installed capacity in Philippines came from deregulation of the power market through the introduction of a build-operate-transfer scheme in 1990, which encouraged private-sector power utilities to enter and fund geothermal plants. These are some examples of

which shows how important political stability in a country represented by its policy to the geothermal development projects. As a result of this then According to Gupta (2009) from 1990 to 1998, the installed geothermal capacity is more than doubled, from 888 MW to 1. 86 GW. As for the case of Indonesia, look at Figure 4 in order to see the kind of government policies that should be created. Moreover, as there is Indonesia’s geothermal law 27/2003 in which it gives the responsibility to confirm geothermal resources to Provincial Governments. Based on this law and the Autonomy Law No.

25/1999, each region now has perception to look after for additional state income from the related the Authoritative Territorial Mining (WKP). In the old geothermal contract based on the presidential decree no. 49/1991, the government income is 34%, and this is “ all in”. Thus, when there is fluctuation price of steam-electricity and prolonged price negotiation it will deter the target of national geothermal development and the installation of new power plant, expansion. According to Ibrahim, et al. 2005) due to this new regulation thus when there is and inadequate information on geothermal reserve and field utilization on that region thus it will also deter the overall development target. Another geothermal issue, the difficulty in determining land for expansion and development has already resulted in the uncertainty of its utilization.

Based on the last operations, some factors are causing delayed such as restricted transmission infrastructure facilities and distribution constraint resulted on delayed development program and schedule. This is due to the fact the difficult domestic funding scheme decelerated the energy sector

development including geothermal development. In accordance to this, thus making it region becomes less attractive though it has high geothermal potency.

Overall, the business opportunity in the geothermal development is high, as shown in Table 5, the following years to come, the electricity demand in Indonesia increases. Resulting higher urgency to the development of geothermal as the alternative energy to solve the problem of electricity shortage in Indonesia. This urgency later then respresented by the fast track program to install more of installed capacity. And by this, thus the business opportunity is also increases, with the note that the political condition represented in Indonesia’s policy to this project is stable and condusive.

Conclusion In the relation of electricity shortage in Indonesia nowadays, geothermal energy is considered to be the solution of this problem. Not only because it is renewable resources but also creates lower emission problem to the environment of which it is supported by the fact that Indonesia is abundance in its supply by its geographical position. In the long term it will gives lower cost though in the exploitation stage its cost is very high. However, as the development of this energy is practically very interesting to the investors (or business players) not to mention that in the future, the electricity demand in Indonesia is projected to face higher that the current year, thus it gives this sector’s development creates bigger business opportunity. The only factors that Indonesia’s need to maintain is the business environment itself, through its political decision in making or passing the regulation that is closely relate to the further development of

geothermal as an alternative energy. Such inconsistency or policy that perceived as making the geothermal development becomes hard, then it will surely make this sector or project becomes less attractive though financially, it will offer a higher net present value in the future. References Advameg, Inc.

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Energy News: Indonesia's Geothermal Development. [Online] February 15, 2002. [Cited: November 17, 2009.] http://jakarta.

usembassy. gov/econ/geothermal. html. Table 1: Shares of Fossil Fuels for Electricity Generation in SEA (%) [pic] Source: Malla (1993) Table 2: Total Fossil Fuels Consumption (thousand toe) for Selected Years and Average Annual Growth Rate (AAGR) for Fossil Fuels, 1974 -1992 (%). [pic] Source: Malla (1993) Table 3: Conventional energy resources are limited | Energy | Potential | Proven | Production (P) | R/P | | Resources | Resources | Reserve (R) | | Ratio (years) | | Natural gas | 334. TSCF | 165 TSCF | 2. 79 TSCF | 59 | | Coal | 90.

5 billion ton | 18. 7 billion ton | 215 million ton | 86 | | Coalbed Methane | 453 TSCF |- |- |- |