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Future of Geothermal Development in Indonesia

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ABSTRACT

As a country with spread volcanoes area, Indonesia is carrying out the biggest potential on geothermal energy in the world which is around 40% of the world reservation or similar to 20Gwe or 9 (nine) billion barrel oil for 30 years of operations located at Sumatera, Jawa-Bali, Sulawesi, NTB, and NTT. The world allocated potential of geothermal energy is only 20% from the total of 50,000 MW or around 10,000 MW and in Indonesia the benefit we consume is only 3-4%.

The usage of Indonesian geothermal within electricity sector is quite prospective with sharp increase record from 1982 (32,25 MW); 1990 (142,42 MW); 1998 (587,5 MW); and 2000 (1,159 MW). There is also a wide range of geothermal energy contribution that obviously beneficial from spa to tourism objects.

In regard to the above explanation, Indonesia prepares the vision and mission as the main frame of geothermal energy development in Indonesia. It is that geothermal as the accessible resource to support sustainable development in Indonesia is set as the vision for geothermal development in Indonesia. While with the mission, Indonesia arranges its huge deposit geothermal energy as renewable and environmental friendly resource and explore it to gain more value add for the purpose of realizing the safety of Indonesian people.

Being the energy with potential and strategic role to support Indonesian development, geothermal energy therefore require authorized main frame for operational improvement, management, rearrangement, and utilization of both the direct and indirect use; and for that reason, Indonesian Legislative prepared the Regulations on Geothermal – UU No. 27/2003.

The future of geothermal energy development post-Regulations is obvious for the economic improvement in Indonesia due to the present of sufficient protection towards geothermal energy. Indonesia is preparing general regulations on the Geothermal Implemented Regulation (Peraturan Pelaksanaan), the unity towards perception on development strategy, the encouragement on the transparent and competitive utilization of material and service, and the appointment of independent or government institution with the authority to cope with disagreements that may take place.

The severe economic crisis that started in late 1997 has adversely affected the formation of geothermal blueprint in Indonesia. Geothermal energy development program is divided into short term, mid term, and long term. The short-term program covers the existing contracts management (stated in the article 41, 42, and 43 on the Regulations on Geothermal - UU No. 27/ 2003), strategic plans for geothermal development, synchronization over Regulations on Geothermal and Electricity (UU No. 27/ 2003 and UU No. 20/2002). While the mid and long term program cover geothermal exploration legislative program, energy price regulation, geothermal development socialization, geothermal development strategic plan modernization, geothermal information and data system development, human resource and technology development plan, and community development.

The future of geothermal energy development and-Regulations is projected to the economic improvement in Indonesia and to suffice protection towards the industry players. Indonesia is preparing general regulations on the Geothermal Implemented, the unity towards perception on development strategy, the encouragement on the transparent and competitive utilization of material and service, and the appointment of independent or government institution with the authority to cope with disagreements that may take place.

1. INTRODUCTION

Indonesia has the biggest geothermal energy potentials in the world, with approximately 20,000 megawatts (9 Billion BOE) or 40% of the world geothermal energy reserves and stands to benefit from developing its abundant and indigenous geothermal resources to provide for its domestic needs.

It is widely recognized that emissions of man-made greenhouse gases (CO_2) are largely contributing to a general increase in global temperatures. However, geothermal energy has proven to have significant environmental benefits due to less air emissions, land disturbance and transportation. Significant capital investments for geothermal developments together with increasing exports of fossil fuels and coal yield a healthy and expanding economy as a foundation for a prosperous nation.

An energy law aimed at reducing the use of fossil fuels for generating electricity by increasing the use of renewable energy should be developed. The basic principles of supply and demand suggest that world prices for dwindling fossil fuels will significantly increase in the coming decades. Indonesia needs to be balanced in the energy mix to benefit from the clean geothermal energy. Therefore, diversification of fuel is a must to assure a stable and economically priced electric power. When a region becomes too dependent on fossil fuel, an abrupt change in electricity price due to elimination of subsidy for fossil fuel prices, for example, can cause a significant impact on the entire economy.

Geothermal resource areas along Sumatra, Java, Bali, Sulawesi and Maluku Islands is usually found in remote mountainous terrain. Many of these areas are covered by fertile soil from volcanic activities but they are undeveloped due to remoteness from urban cities and lack of supporting

infrastructures. It is almost certain that development of geothermal resources in these areas will involve huge amount of money to develop and build the infrastructures. Once the infrastructures are developed, people will move in to search for a better live. These phenomena can be detrimental to geothermal operations if not properly managed.

The Indonesian Geothermal Association (INAGA) is formed as Indonesia government partner and serves as a professional communication forum for geothermal community engaged in the development of geothermal industry in Indonesia. In doing its activities, INAGA upholds its vision so that geothermal resources become energy of choice in the expanding Indonesia energy market by virtue of its natural environmental benefits and its potential opportunities to add value in supports of Indonesia's sustainable national development.

This paper presents an expected pattern for geothermal development and utilization in Indonesia. To implement the geothermal project, local government and developers must take proactive role in initiating and continually supporting national energy and power programs throughout the participation of private sectors.

2. DEVELOPMENT CHALLENGE

Indonesia needs significant investment (12,000 MW) in new power generation in the next few years. The government cannot fund even the smaller amount (5,000 MW) that is urgently needed by 2007. The private power investments in Indonesia are extremely unlikely in the near term even though a significant private investment in the power sector seems the future answer.

The current eighteen mining contract areas (Authoritative Territorial Mining-WKP) of which seven has at least produced 807 MW geothermal electric power, is still aiming to support to 4,600 MW geothermal electric power plan by the year 2016.

2.1 The Existing Operations Issue

Developers currently are growing with concerns on the possibility of changing contract substance. Due to the insufficient policy and implementing regulation, the geothermal industry could likely be getting way with unreliable accountability. Based on Geothermal Law No.27/2003 and Autonomy Law No.25/1999, the region now has perception to look after for additional state income from the related WKP. In the old geothermal contract based on the presidential decree no.49/1991, the government income is 34%, and this is "all in".

The happening fluctuation price of steam-electricity and prolonged price negotiation deter the target of national geothermal development and the installation of new power plant, expansion. The inadequate information on geothermal reserve and field utilization 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.

2.2 The New fields for Bidding

Due to the no implementing regulations, prospective area will not be ready for bid to the new investors. Referring to Law No.20/2002 on electric power, the utilization of geothermal energy as renewable energy is prioritized compared to fossil. But, the further explanation is required to make clear further explanation. In the Geothermal Law No.27/2003, reliable existing institution to manage the field is required as one of an important factor to run the HULU (upstream) of geothermal exploration/exploitation program. At the present, some regions already enjoy full development support of their geothermal resources due to easy to get to the resource but, east regions and remote areas have not received equal chance of development.

3. GROWTH DETERMINATION

The timetable for geothermal development will reflect national priorities. A geothermal road map with 6,000 MW target should have a clear and achievable set of reform targets in 2020.

3.1 Development to 4,600 MW Plan

By socializing the Geothermal Law No.27/2003, especially article 41 & 43, it will help to confirm and ensure that development can be established without changing the contract substance. There moreover will be in line policies and guidelines based on the Geothermal Law No.27/2003 and the Implementation of Regulation No.31/2003 (subject to Pertamina), to coordinate and enhance the ability of the related institutions. The Geothermal Implementing Regulation will be declared soon to ensure the Government income share is based on legal contract and valid regulations.

The Ministry of Finance, Ministry of Energy, and the Local Government should come up with the agreed regulation on geothermal fiscal (tax & non-tax) which elaborate the government share (local and central) and 34% of the regional government income. To avoid possible conflict with the local people due to high expectation, the CD policies/guideline should be available and explained clearly. All stakeholders moreover together with the developers, must be cooperative and actively effect in the one-coordination and community based CD program implementation.

The clear guidelines are needed to establish integrated policies on energy pricing, fiscal and tax, internalization of environmental cost (depletion premium, CDM & carbon trade), accelerate regional tariff implementation and risk allocation policies. These policies should be formulized based on the stakeholders concerns; Ministry of Energy, Ministry of Finance, Local Government, PLN, PERTAMINA, and Developers. This will be related to the government regulation on the price issues agreed to the Presidential Decree (Keppres) No.39/1997, Keppres No.47/1997, Keppres no.5/1998, PPA contract, and UU No.20/2002.

Policies on assessment to the potential and supply of the current 18 WKP need to be proposed based on Law No.27/2003. The facilitators involve Geology and Mineral Resource (DJGSM), Electricity and Renewable Energy Development (DJLPE), PT. PERTAMINA functions will work closely with developers who will elaborate their vigorous development plans. Next, the presidential decree on land utilization for geothermal development plan should be proposed based on law No.41/1999. The Ministry of Energy and Ministry of Forestry together with the Local

government will be involved in the one-structure of coordination.

Some factors were causing delayed such as restricted transmission infrastructure facilities and distribution constrain resulted on delayed development program and schedule. This problem can be avoided in the future by including the National Infrastructure Development Plan (RUKN) result generated from the RPTL and RUKD (local plans). Here, the Geology and Mineral Resource (DJGSM), Electricity and Renewable Energy Development (DJLPE), and PLN shall work together to locate their concerns to the RUKN regarding the need of PLTP project plans.

Developer should establish clear time-frame and pricing which ideally supports the actual structure cost of electric power development. This supervision issue involves the Geology and Mineral Resource (DJGSM), Electricity and Renewable Energy Development (DJLPE), PT. PERTAMINA. Aligning with the target of 6,000 MW in the year 2020, a numbers of new geothermal fields will be ready for bidding. An additional of 1958 MW is expected to be ready-for-use between the year 2012 and 2020.

Considering the future development of numerous WKP (Authoritative Territorial Mining) that is still suspended, the new WKP target is pessimistic. The exploration funding sources therefore will be structured in the near term of policies based on UU No.27/2003. Here, the evaluation and exploration will be carried-out by the Directorate General of Geology and Mineral Resource with the involvement of the Ministry of Finance. A proposal on investment policy and regulation regarding domestic funding scheme is required to the Ministry of Finance to the operation of exploration programs.

3.2 Development Toward 2020

The State Secretary, Ministry of Energy, Ministry of Finance and other related stakeholders should begin conceptualizing a presidential decree on bidding procedures. Policies on integrated 'Upstream and Downstream' management pattern will visually exist to eliminate the miss development plan.

Inferior service for data and information will result in the lack of investor and community interest in geothermal development. Therefore, the proper and integrated information system of national geothermal plan will be established through the development of management system nationally and regionally by DJGSM, DJLPE, and Balitbang (Research Centre).

One-door-stop institution must be formed to implement exploration project along with the establishment of control system in the region as well as in the central.

This action will involve the stakeholders; central and local governments to smooth the project implementation. Based on the Law No.20/2002 and Law No. 27/2001, the government will have to impose for priority on using the local geothermal electric power and create the PP (Implementing Regulation) on geothermal development for remote area. This policy is important and shall include the practical use; electric energy and direct utilization.

4. CONCLUSION

Quite separate from the industry reform effort, Indonesia has a significant challenge to attract private power. Although at present 6,000 MW geothermal equivalent supply of power is available expected, there is still no exact record on the number of growth that causes difficulty to implement to a long-term geothermal development.

Based on the Law No.27/2003, policies to enhance institution's technical and financial ability should be made soon. Immediate inventory, general investigation and exploration therefore are the action plans to carry out by the Ministry of Energy and Ministry of Finance.

Long-term industry reform program should be implemented peacefully to avoid action that would raise concerns with the investors.

Some reform outcomes that might worry private power investors are as follows:

- Introduction of new independent regulation that might have jurisdiction (PPAs may be easy target for new regulator)
- Separation of distribution/retail that collects money from generation that pays for power under PPA (i.e, implicit disallowance)
- Change of counterparty (e.g., PPA holder is initially entire utility, but reforms mean that only the local generation utility is the new counterparty, raising credit risks)

5. REFERENCE

Geothermal Development Road Map of 27,000 MW, March 23, 2004.

Guidelines and Fixed Pattern for Development and Utilization of Geothermal Energy, "Blueprint for Implementation of Law No. 27/2003 on Geothermal Energy", December 2003.