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Renewable Energy Act of 2008: Hits and Misses for the Philippine Geothermal Industry

Fernando S. Peñarroyo

Puno and Peñarroyo Law, Makati City, Philippines

fspenarroyo@punopenalaw.com

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ABSTRACT

The enactment of the *Renewable Energy Act of 2008* ("*RE Act*") and its implementing rules and regulations was expected to open the way for the entry of risk capital in geothermal exploration, development and utilization. The Department of Energy ("DOE") admitted that progress on implementing support systems for renewable energy development in the power sector has been hobbled by delays. The Philippine government initiated major structural reforms in the geothermal industry sector by undertaking the privatisation of geothermal generating assets and divesting its interests in the state-owned geothermal development company. Like in any resource development project, the Philippine government needs to address issues related to the complicated approval and permitting process to reduce and expedite procedures particularly in foreign ownership, land use, environment and social acceptability regulations. Needless to say, streamlining the permit process by government regulators will have an impact on geothermal development, as shorter project periods would reduce uncertainty for policy and market dynamics when modelling economic returns. As geothermal projects are characterized by significant upfront capital investment for exploration, well drilling, and the installation of plant and equipment, the DOE must develop publicly available database protocols and tools for geothermal resource assessments to facilitate access by developers to risk capital. Government regulators must also develop guidelines for the inclusion of non-conventional and leading edge geothermal technologies in the setting up of feed-in tariff rates. Risk mitigation instruments like risk guarantee schemes and geologic risk insurance will also encourage investments in geothermal exploration.

1. INTRODUCTION

The renewed interest in geothermal energy is the result of world economic and political forces—mainly increased oil prices and moral preference for renewable energy—combined with advances in technology that make geothermal energy more accessible. The *RE Act*, signed on 15 December 2008, paved the way for renewed interests in the exploration and development of geothermal energy resources. However, the Philippines is still trying to get over its reputation in the resources industry as an investment destination lacking in competitiveness with an unattractive business climate hobbled by an unpredictable policy environment and poor regulatory quality. This paper seeks to discuss what the milestone legislation has achieved so far, what the government needs to do and how administrative agencies should address legal/regulatory issues and policy considerations.

2. ENERGY OUTLOOK

According to Bloomberg's *Global Renewable Energy Market Outlook 2013*, under the Traditional Territory scenario, the utilisation of shale gas expands rapidly lowering international gas and coal prices with moderate environmental concerns largely appeased by more use of gas. Main energy investments go into trusted technologies of gas and coal and nuclear weakening support for policies for new energy technologies. Under the New Normal scenario however, rising demand for energy from developing countries outstrips supply resulting in the rise of prices of fossil fuels. The role of Organisation of Petroleum Exporting Countries ("OPEC") is reduced temporarily over the next ten years by rising output from the United States, from oil sands in Canada, from deep-water production in Brazil and from natural gas liquids from all over the world. But, by the mid-2020s, non-OPEC production starts to fall back and countries in the Middle East provide most of the increase in global supply. (IEA, 2013)

In the New Normal scenario of Bloomberg, by 2030 renewables will account for 48% of total power generation capacity installed around the world, up from 28% in 2012, dominated by wind (rising from 5% in 2012 to 17% of installed capacity by 2030) and solar PV (capacity growing from 2% in 2012 to 16% by 2030). Installed geothermal generating capacity expansions are occurring worldwide with an increase of 1,782 MWe in installed capacity (from 8,933 to 10,715 MWe) between 2005 and 2010 (Bertani 2010). By 2015, worldwide generating capacity is expected to exceed 18,000 MWe.

The IEA forecasts global geothermal electricity generation increase from 68 TWh to more than 300 TWh and capacity from 11 GW to over 40 GW between 2010 and 2035. Most of these projected increases occur in the United States, Japan, the Philippines, Indonesia and in African countries, particularly North Africa. (IEA, 2012)

According to the *IEA Geothermal Roadmap* (2011) geothermal energy can provide base-load power and heat from high-temperature hydrothermal resources, deep aquifer systems with low and medium temperatures, and hot rock resources. By 2050, geothermal electricity generation could reach 1 400 TWh per year, i.e. around 3.5% of global electricity production. In the period to 2030, rapid expansion of geothermal electricity and heat production will be dominated by accelerated deployment of conventional high-temperature hydrothermal resources. Deployment of low- and medium-temperature hydrothermal resources in deep aquifers will also grow quickly, reflecting wider availability and increasing interest in their use for both heat and power.

In principle the Philippine government is actively encouraging the development of renewable electricity generation in the country through National Renewable Energy Program, which outlines the government's goal to increase renewable energy capacity to 15,304 MW by 2030, three times 2010 levels. This includes an increase in geothermal power capacity by 75% with an addition of 1,465 MW for the period 2013-2030. (DOE, Philippine Energy Plan 2012-2030)

3. GEOTHERMAL ENERGY DEVELOPMENT IN THE PHILIPPINES

Large government-owned utilities played a big part in the initial phase of geothermal deployment. Donor programmes, in the form of donated equipment and technology transfer, and government subsidies were provided to these utilities and played a key role in funding exploration and development activities. As commercial markets for renewable energy expanded, investment patterns shifted away from traditional governments and donor sources to greater reliance on private firms. Geothermal development became highly dependent on private equity financing.

The liberalization of electricity markets along with increased government support mechanisms - tax credits and grants, renewable portfolio standards, and feed-in tariffs - and an increased emphasis on clean energy have seen new players emerge on the scene to compete with established geothermal developers. In the last two decades the privatization of public utilities and the emergence of pure-play geothermal developers, which focused more on resource development rather than power plant operation, have led to a dramatic increase in publicly-listed geothermal developers competing in the equity markets (KPMG, 2010). Although slowed somewhat by the financial crisis of 2008–2009, financing geothermal development has become more challenging. The financing options before the economic crisis of 2008 are more difficult to find today, especially debt financing. Debt is available but banks still see geothermal as high risk influencing the cost/tenor of debt and a need for syndication (Allen, 2012).

The geothermal energy sector is about to enter a new growth, as governments around the world have been moving towards a cleaner energy economy. However, geothermal development is a very complicated process requiring a broad range of skills and specialized services. The difficulty in attracting financing is a result of investor not having the same level of knowledge about geothermal energy as they do with conventional sources of energy. It is also a relatively small sector with knowledge and experience concentrated in a small number of companies. (KPMG, 2010)

3.1 Philippine Experience

The process of geothermal deployment in the Philippines can be divided in five different phases, i.e. 1) the first wave from 1962 to 1984, 2) the first stagnation from 1985 to 1992, 3) the second wave from 1993 to 2000, 4) the second stagnation from 2001 to 2008, and 5) 'the third wave?' from 2009 onwards (Hamaguchi, 2013). The Philippine National Oil Company – Energy Development Corporation ("PNOC-EDC"), the national geothermal development company, pioneered geothermal energy development by availing of soft loans afforded by lending institutions. Through a series of legislation the government declared geothermal reservation areas for geothermal development and provided incentives to developers (Catigtig, 2008). The geothermal industry was further opened to private capital when state-developed resources were privatised and the electricity industry was deregulated through the selling of power generating assets owned and operated by the National Power Corporation.

The first wave of geothermal deployment in the Philippines was brought about in the early 70s by macro-economic trends i.e high-oil prices and increasing electricity consumption under a Martial Law government, which put pressure on the existing electricity supply system to accommodate geothermal energy. This initial wave saw the change of legislative framework from *RA 5092* ("*Geothermal Energy, Natural Gas and Methane Gas Law*") to *Presidential Decree ("PD") No. 1442* ("*The Philippine Geothermal Service Contract Law*"), and the creation of PNOC-EDC. Understandably, Martial Law facilitated geothermal energy exploration and development as the energy bureaucracy operated under a legal regime where there are no or limited laws on environment, social acceptability, indigenous peoples rights, protected areas, land access issues, local government devolution. (Velasco, 2006)

The deployment of geothermal energy stopped during the mid-1980s resulting from low oil prices and the change in administration from Marcos to Aquino. Growing electricity demand continued to put pressure for additional energy source development paving the way to the change in regulative rules allowing independent power producers' participation in power sector under *Executive Order No. 215* ("*National Policy on Private Financing, Construction & Operation of Power Plants*") and *RA 6957* ("*Build Operate and Transfer Law*"). Three geothermal projects were put on stream, which were facilitated by official development assistance loans. (Hamaguchi, 2013)

With the commencement of operation of BacMan I and Palinpinon II in the early 1990s, the second wave of geothermal deployment started. The Leyte and Mindanao power plants were also put on-stream during this period (Ogena and Fronda, 2013). Rapid economic growth, growing electricity demand and the power crisis put pressure to accommodate electricity from geothermal resources. The development of descaling technology encouraged further geothermal deployment. (Hamaguchi, 2013)

The second stagnation period started following the Asian Currency Crisis in 1998. The aftermath of the crisis slowed geothermal projects. In the meantime, the Philippine government initiated major structural reforms in the geothermal industry sector. Under the provisions of the *RA 9136* ("*Electric Power Industry Reform Act of 2001*"), the government embarked on the privatization of National Power Corporation's geothermal generating assets such as: the Makban Geothermal Steamfield and Power Plants in Laguna/Batangas; Tiwi Geothermal Steamfield and Power Plants in Albay; Palipinon I and II Geothermal Power Plant in Negros Oriental; and Tongonan I Geothermal Power Plant in Leyte. The Unified Leyte geothermal plants and the Mt. Apo 1 and 2 plants were likewise placed on the auction block.

The government also divested its interests in PNOC-EDC paving the way for the entry of new players in the geothermal industry. PNOC-EDC, which operated the Leyte, Bacon-Manito, Palinpinon, and Mindanao steam fields and owned power plants in Leyte and Mindanao, was fully privatized in 2007 with the sale thru public bidding of the 60% government interest to Red Vulcan Corp., a consortium controlled by First Gen Corp after the initial public sale of 40% of its stocks in 2006.

The government hopes to ride on the period of **'**The Third Wave?**'** with the passage of the *RE Act*. A total of nine Geothermal Renewable Energy Service Contracts ("GRESC") under the Open and Competitive Selection Process ("OCSP"), five operating contracts and 22 service contracts under Direct Negotiation for frontier areas and seven conversions of service contracts under *P.D. 1442* into GRESCs under *R.A. 9513* were signed. To date, the country has 43 service contracts, seven (7) of which are producing fields with total installed capacity of 1,868 MW, while the remaining are under pre-development/exploration. Under the RE Law,

the 20-MW Maibarara Geothermal Power Project was commissioned on 08 February 2014. The DOE implemented *Department Order No. DO2013-08-0011* (**"***Adopting Policies in Relation to the Processing of Renewable Energy Service Contracts and Mandating the Adoption of the Revised Templates for Renewable Energy Service Contracts*"), which applies for direct negotiations. The DOE is also finalizing the Guidelines and Terms of Reference for the geothermal areas to be offered under the OCSP, which is targeted to be launched on the third quarter of 2014. (Marasigan, 2014)

3.2 Certified Emission Reduction Market

The Philippines ratified the United Nations Framework Convention on Climate Change ("UNFCC") in August 1994 and the Kyoto Protocol in November 2003. To enable the country's participation in the Clean Development Mechanism ("CDM") under the Kyoto Protocol, *Executive Order 320* appointed the Department of Environment and Natural Resources ("DENR") as the country's Designated National Authority ("DNA") for CDM. The DNA grants the host country approval of a proposed CDM project, which is a prerequisite to its registration by the CDM Executive Board. The EMB serves as the CDM Secretariat. The DENR established a set of national criteria for determining whether a proposed CDM project activity contributes to the country's sustainable development goals and evaluates compliance against such criteria through technical evaluation committees and a CDM Steering Committee composed of representatives from government agencies, the private sector, and NGOs (EMB, 2006).

Geothermal energy projects may be registered under the CDM and earn emission reductions, which become Certified Emission Reductions once they have been through the approval processes required by the UNFCC. These can then be traded in the global carbon market. Geothermal projects are eligible to register under the CDM by virtue of utilizing RE sources that offsets fossil fuel generated electricity and exporting electricity to the grid. All proceeds from the sale of carbon emission credits shall be exempt from any and all taxes.

3.3 Risks and Mitigating Measures

Despite the passage of the *RE Act*, the private sector identifies three major risks besetting the Philippine geothermal industry: exploration and development risk; market risk; and financing risk. The good news is that the domestic market is ready, as the mainstream private sector has joined the power generation bandwagon. Local banks are now extending long-term financing to local power projects but due to the high risk involved with geothermal exploration, Philippine banks do not provide loans until the later stages in the development process (Tantoco, 2012). Domestic companies focusing on optimizing existing resources currently dominate private ownership. Financing is either largely through corporate equity or borrowings (Allen, 2012). Among the risk mitigating measures suggested by the private industry are:

3.3.1 Central Geothermal Database

Availability of reliable and accurate geothermal resource information is always a concern for resource developers in order to mitigate future cost and risk during exploration, drilling and production. A geothermal database to be made available to the public through a centralized web application and accessible for a fee must be established that would serve as a central depository for geothermal resource data. To this end, the DOE should be able to access all proprietary data and information previously generated by geothermal service contractors. A well-documented geothermal database will increase resource certainty and reduce risk to attract capital.

3.3.2 Geothermal Resource Classification System

DOE should fund or seek funding for the development and adoption of protocols and tools for geothermal resource assessment to address the lack of standardized methodology, which classifies potential geothermal resource sites based on a set of geothermal resource criteria and attributes for the use of developers and investors. There are two existing Geothermal Reporting Codes, which the DOE can adopt - the Australian Geothermal Reporting Code initially published in 2008 and reviewed in 2010, and the Canadian Geothermal Reporting Code published in 2010. Key elements of the Australian Code were adopted and formed the basis of the Canadian Code. (Beardsmore, 2013)

It is noteworthy that the Philippine Stock Exchange is relaxing the rules for RE firms seeking to list on the local bourse to fund the development of their expansion by proposing rules, which were drafted with the DOE. Presently, the exchange does not implement a specific and separate set of listing requirements and reporting standards applicable for RE companies similar to the Philippine Mineral Reporting Code for mining companies.

3.3.3 Incentives in Exploration Drilling

Because of the high cost of exploratory drilling, a focused exploration-drilling program can be put in place with possible help application for government or development funding. An evaluation of the developer's resource site and ability to successfully develop and finance the project should be prerequisites for funding under the program. (Deloitte Development LLC, 2008)

In some emerging markets there have been (are) efforts to cover the risks of exploratory drilling, examples of which are: ARGEO – well insurance in East Africa – never really effective as no access to fund wells; $18m facility; KfW – new well financing option – % of exploration costs and of cost of exploration wells upfront, additional grant if successful; contingent well drilling finance for exploitation – yet to be implemented and only $75m facility; and Geofund Turkey to support drilling and provide insurance - $10m facility. (Allen, 2012)

3.3.4 Political Risk Guarantee

Some forms of risks can be fully or partially covered through normal business insurance or through special cover provided either by private insurers or by official (multilateral and bilateral) risk insurance and export credit agencies. The Philippines like other developing countries lack a sophisticated local insurance industry to cover such risks.

Partial risk guarantees may cover up to 100 percent of a loan for specific political risks. Political risk guarantees covers creditors for specified sovereign risks arising from a government's default on contractual obligations, or the occurrence of certain force majeure events of a 'political' nature. Such risks or events might be specified to include: (a) maintaining an agreed regulatory framework; (b) compensation for delays or interruptions caused by government actions (delays in providing license approvals and consents etc.); (c) change of government resulting in the new government reneging on the commitments of its predecessor; (d) unfavourable changes in national laws; (e) expropriation and nationalisation; (f) the host government obstructing an agreed process of arbitration; and (g) non-payment of agreed termination amounts or an arbitral award following a covered default. (Scoping Study on Financial Risk Management Instruments for Renewable Energy Projects, UNEP)

Other risk mitigation measures suggested include funding assistance from development agencies providing long-term facilities or equity contributions. However, as proponents usually are private geothermal players, funding assistance from development agencies may not be directly available to them since these are mostly government-to-government transactions. The government may assist the private sector in the assumption of some of the financing risks of the project on a case-to-case basis and after thorough evaluation of the project and financing requirements.

Cheaper political risk insurance can be substituted by equity contributions by government or development agencies. However, other non-energy infrastructure projects are competing with renewable energy projects for scarce funds from development agencies. The government may also coordinate with financial institutions or special funds to provide medium or long term financing to the private institution. Regulators must however be wary of the possibility that government's assumption of certain financing risks might inflate public debt. Imposing certain limitations in equity investments can prevent this. Government should be able to manage and forecast expected and contingent liabilities arising from guarantees and future subsidies in support of geothermal.

4. LEGAL AND REGULATORY

Host governments should establish a complete and fully integrated legal and contractual infrastructure that clearly allocates and identifies risks and management instruments. Geothermal development is best described as a process of managing all the various risks inherent in any development project, but made more complex because of the nature of the "fuel." Geothermal resources cannot be purchased on the open market, transported over long distances, or stored for long periods of time. Although fuel risk may be rated as the number one risk factor facing geothermal development, environmental, legal, and institutional factors may rank number one in terms of their impact upon the successful development of geothermal projects. (Bloomquist, 2009)

Geothermal energy development projects in the Philippines face a host of foreign ownership, environment and land access issues, regulatory and permitting requirements, interconnection, and tax considerations.

4.1 Foreign Ownership

While geothermal was defined under the law as a mineral resource opening the way for the entry of 100% foreign-owned corporation in exploration, development and utilization, the Philippine government has yet to award such contracts to foreign companies. In Philippine law, the term "minerals" has historically included geothermal energy. In *PD 463* ("*Providing for a Modernized System of Administration and Disposition of Mineral Lands and to Promote and Encourage the Development and Exploitation Thereof*") (1974), the term "minerals" was defined as, "all naturally-occurring inorganic substances in solid, liquid, and intermediate states including coal. Soil, which supports organic life, sand and gravel, guano, petroleum, geothermal energy and natural gas are included in this term but are governed by special laws." Furthermore, the governance of the exploration, development and exploitation of geothermal resources was placed under the responsibility of the Bureau of Mines in 1967 by virtue of *RA 5092* ("*Geothermal Energy, Natural Gas and Methane Gas Law*"). Although jurisdiction over geothermal resources was subsequently transferred to the then Bureau of Energy Development (now the DOE) by virtue of *PD 1442* (1978), in relation to *PD 1206* (1977), the purpose evidently was not to reclassify geothermal energy but simply to rationalize the organization of the Philippine Government and to emphasize the importance of the exploration and development of energy resources. *RA 7942* ("*Philippine Mining Act of 1995*") adhered to *PD 463's* definition of "minerals", although it specifically excluded "energy materials" such as geothermal energy, which are in turn governed by other special laws. This specific exclusion does not negate geothermal's classification as a mineral resource; rather, it emphasizes the legal and technical acceptance of such classification. To be sure, such specific exclusion would not have been necessary if legal and technical experts had not recognized that geothermal resources are classified as a mineral resource.

Geothermal has been defined as minerals in other jurisdictions. The DOE's reluctance to award service contracts to foreign companies is clearly a disincentive to geothermal development. Foreign companies will bring in more risk capital, new technology, and the needed competition to existing domestic players currently dominating the landscape. The government's ambivalence in opening the geothermal sector to foreign ownership is a test of its resolve and seriousness in attracting investments that will compete with established local companies.

4.2 Environment

The relevant environmental regulatory framework including national laws, international standards, and good practice guidelines must be established upon embarking on a geothermal project. Environmental regulations, standards, and guidelines provide practical information concerning emissions limits, noise pollution, water usage, land usage, waste disposal, subsidence, induced seismicity, and impacts on wildlife and vegetation should be benchmarked. While environmental due diligence can establish existing laws and regulations that currently affect the project, the most trying for developers is that of anticipated laws and regulations (e.g. in process of development, discussion, or approval) that may change the conditions under which the project must operate. (Environmental Due Diligence of Geothermal Energy Systems, UNEP)

As in any other geothermal development elsewhere, developers in the Philippines face many obstacles, and one of them is inadequate public understanding of geology, hydrology, and the related sciences that underlie geothermal energy. Government administrators must work doubly hard to address cognitive barriers, which relate to the low level of awareness, understanding and

attention, afforded to the complex array of policy, regulatory, technical financing and organisational factors affecting geothermal projects and their wider economic and environmental benefits. Cost benefit analysis must be been taken to start valuing/accounting for greenhouse gas mitigation or pricing the impacts of climate change. Project proponents find it frustrating that opposition against geothermal projects based on environmental concerns is clearly the effect of a low level of appreciation for the benefits of geothermal energy.

4.3 Local Government

For LGUs where resource development have been part of their revenue generation, they are more concerned with the assurance that communities hosting resources development would get their timely share of the proceeds. However, more than fair and prompt revenue sharing, public advocacy groups believe that the main issue is the autonomy of local communities to accept or veto development projects normally approved at the national government level. Other issues raised by local governments include: wastes, emissions and pollution; loss of agricultural land and subsequent livelihood; threat to water resources; relocation and right of way; and health and safety of workers and communities. Devolving the mandate of environmental protection to LGUs including the power to impose local taxes is now being brought to the limelight with the interrelated issues of resource development, environment and revenue generation.

The legal issue of local autonomy in relation to the exploration, development and utilization of natural resources *vis a vis* the power of control by the executive over LGUs will only be settled by judicial interpretation and until then lingering uncertainties will prevent developers to put more money into the ground.

4.4 Indigenous Peoples Issues

Resource and infrastructure developments are often concomitantly related to indigenous peoples ("IP") rights issues. IP rights are closely associated with human rights with environmental and ethical business practices considerations. Among the project due diligence and risk assessments a resource and infrastructure developer must perform is the determination of the presence of IPs, who usually claim and occupy areas of critical environmental significance, cultural heritage or high biodiversity.

From the perspective of IPs, free and prior informed consent ("FPIC") to development projects is regarded as a means for operationalizing the right to self-determination, respect for IPs decision-making processes and the associated right to accept or reject projects that will affect them. To IPs the right to FPIC is rooted in the exercise of customary law. However, recognition of IPs' right to veto proposed developments brings concerns that such rights perceived rightfully or wrongly, poses an obstacle to national development.

International jurisprudence states that it is not enough for governments to invoke the public or national interest when considering allowing development on IPs' lands; they must satisfy other legal requirements. As gaining IPs' consent through a formal and documented process may provide developers a stronger license to operate, it is thus important that developers undertake a thorough understanding of the legal and regulatory framework with IPs. Given the complexity in applying the concept of FPIC, development agencies and the private industry are more inclined to adopt the standard of '*free, prior, and informed consultation resulting in broad community support*' where 'broad community support' is interpreted as requiring 'good faith negotiation with and informed participation of indigenous peoples'. In the Philippine context, the ruling of the Supreme Court to uphold the constitutionality of *IPRA* was due to a technicality. The resolution mandating the State *to consult the IPs in accordance with the intent of the framers of the Constitution* when it intends to engage in development activities in IP lands, in effect was a 'decision without a decision'. A constitutional revisit of IPRA seems to be in order to put all resource development stakeholders in the proper perspective given the inherent instability of the decision. Even if there is significant progress towards acceptance of the right to FPIC, there is still considerable confusion about how this right is most effectively exercised by IPs and best respected by other stakeholders in the resources industry.

4.5 Transmission Access

Resources are often located in remote areas beyond the reach of the existing power grid, and construction of power lines can be an expensive and contentious endeavour. To meet the challenges brought about by lack of transmission infrastructure, delays in grid connection, and curtailment of output in locations where current policies and grid management systems undermine integration, government guarantees on electricity dispatch or priority connection must be put into place. In order to obtain project financing and gain access to wholesale power markets, geothermal resource producers must negotiate agreements to interconnect with the transmission system of an existing transmission company. Most lenders and many investors will require evidence of executed generation interconnection and/or transmission service agreements as a condition of financing. A loan guarantee program for electric transmission infrastructure expansion would support large-scale capital investment and would serve as a cost reduction and risk mitigation tool. (Deloitte Development LLC, 2008)

4.6 Taxation

On the fiscal aspects, there are provisions in the *RE Act* and its implementing rules and regulations pertaining to tax incentives that still need clarification and necessitate the issuance of pertinent internal revenue rules and the necessary technical studies. Under Section 15 (e) of the RE Act, an RE developer will pay a 10% corporate income tax instead of the normal 30% rate. Rules must be issued to ascertain whether the RE developers who are using the current 30% income tax rate, but are subsequently found to be entitled to the 10% tax rate can claim a refund of the excess income tax paid in prior years. (Mendoza, 2012)

There should also be a clarification on which kind of income that is attributable to additional investments in an existing RE facility or project is entitled to income tax holiday ("ITH"). Should the ITH only cover the increase in income from sale of energy be by reason of additional investments resulting in an increase in capacity of an existing RE facility? Or should the ITH also apply when the additional investment does not result in increased capacity but has the effect of reducing production/operational costs, increasing efficiency and better product quality? (Mendoza, 2012)

The RE Act provides that the government's share in existing and new RE development projects will be equal to 1% of the gross income of RE developers, which include not just income from the sale of RE produced, but also incidental income arising from the generation, transmission, and sale of electric power. Will requiring the RE developers to pay the 1% government share based on gross income, in addition to national and local taxes, effectively increase government share (Mendoza, 2012)? The national government should also develop a transparent system of accounting for and allocation of sharing of revenues and taxes with LGUs. It must expedite and streamline the release of LGU shares thru a simplified process with timeframe requirements. It should also enhance the correctness and accuracy of tax collections for purposes of ensuring that full benefits from tax collections will be received by the concerned LGUs. The expedited release of host communities' share in the national wealth will lessen local opposition to geothermal projects.

5. POLICY CONSIDERATIONS FOR PHILIPPINE REGULATORS

The Philippine resources bureaucracy is perceived as one prone to create political barriers associated with regulatory and policy issues, which causes market uncertainty and cautious investment approaches. Lack of policy continuity creates an ambiguous view of economic certainty. Any investment made under lingering policy issues is exposed to the numerous reviews and potential changes, which may take place during the lifetime of the project. The regulatory uncertainty makes financing difficult. Needless to say, good governance goes hand in hand with investment promotion. Inviting participants to the geothermal sector is not the end. What is more important is for the government to assure investors that they are able to access the resources within the time frames set under the contracted work programmes.

While the DOE vowed to speed up support systems for RE development, progress has been slow, as the DOE admitted that implementation of the *RE Act* policy reforms has been hobbled by delays. The DOE still has to come up with renewable portfolio standards ("RPS") which will set the capacity needed from each RE technology, including geothermal, as well as the mechanics to connect the main grid to all operational RE plants.

A holistic policy framework is needed that addresses technical barriers relating to the discovery, assessment, access, maintenance and monitoring of the resource, and advanced geothermal technologies. Policy makers, local authorities and utilities need to be more aware of the full range of geothermal resources available and of their possible applications. Transparency, level-playing field and consistent government policies are crucial factors. Returns on investments should be attractive and should guarantee fairness and security from political risks.

5.1 Political Will

Local government units' and indigenous peoples' outright refusal of consents to geothermal resource development within their territorial jurisdiction and ancestral domains respectively, has often created controversies with the national government and the resources industry. Energy projects are unduly delayed because of "non-aligned and non-harmonized laws" and legal roadblocks from local government units, indigenous people and some interest groups whose opposition to these projects are often based on misinformation. The DOE's initiative in pushing for a law that will recognise projects of national significance is a welcome development as a number of energy projects such as geothermal exploration contracts and transmission lines cannot move forward because of local opposition. Congress must promulgate a new law in extreme urgency that will set the parameters for "energy project of national significance". Government should also give assurance that expropriation measures are available as may be necessary, over private lands relevant to the project for steam transportation and electricity transmission. The energy agencies need to take a more cross-sectoral approach to involve other departments and institutions. Laws are in place but implementation is weak. There is also a tendency for laws to be subjected to conflicting interpretations among turf-protecting government agencies.

5.2 Valuing Environmental and Social Benefits

Market barriers affect geothermal resource development due to inequitable market and policy structures. Fossil fuel power generation does not internalise full social and environmental costs. A serious barrier is the fact that deployment of fossil fuel plants have a shorter lead time making them more attractive to a power-hungry economy but with no allowance for environmental externalities. This places renewable energy at a commercial disadvantage but this can be resolved by regulating and internalising the associated cost of greenhouse gas emissions, noise and air pollution. Emissions trading will assist in creating a value and cost associated with such factors. Another barrier is the non-recognition of environmental benefits, which may flow from RE e.g. amenity value and poverty alleviation.

As recognition grows of the contribution that renewable energy can make towards rural development, lowering health costs, energy independence and climate change mitigation, renewable energy is shifting from the fringe to the mainstream of sustainable development. This is increasingly being recognised as an issue that can affect the way companies involved are valued by shareholders and investors.

5.3 Emerging Technologies

The DOE fully realizes that it can no longer hope to discover conventional, "elephant-sized" geothermal resources as these have been fully accessed and evaluated by the former state-owned energy development and public utility companies during the first and second waves of geothermal deployment. The DOE hopes to apply new development technology e.g. those that can tap acidic or young geothermal systems and possibly employ Enhanced Geothermal System ("EGS") in prospect areas lacking in permeability. The DOE also hopes to optimize geothermal resource utilization through cascade use and development of low enthalpy geothermal systems and direct use of small-scale geothermal energy and formulate guidelines therefor. Ongoing study on the exploration, development and market of low enthalpy, acidic reservoir and enhance geothermal systems are currently being undertaken by the DOE. The development of new technology would entail capacity building and enhancement of local geothermal technical expertise. This would also involve a continuous inventory of geothermal resources including those in off-grid and missionary areas for rural development, and improvement of existing geothermal database. (Marasigan, 2014)

With the advent of new technology, government regulators should also look into forming policies covering hybrid energy relationships to increase geothermal power plants' efficiency and capacity. Integrating PV solar farms into existing geothermal plants in order to increase the plant's capacity provides an opportunity to raise source fluid temperatures and even out the inherent intermittency of insolation. The combination of geothermal and solar thermal energy also allows for increased generation in the hot afternoon, when the air-cooled condensers of geothermal binary plants are at their lowest efficiency. Other designs combining gasified biomass and geothermal heat should also be considered. (Horne and Tester, 2014)

Another interesting hybrid technology comes from reported success at projects tapping lithium, zinc and manganese at existing geothermal plants. Such project could help produce lithium, a metal required for energy storage technologies including EV batteries (Blodgett, 2011). The government must formulate laws and guidelines that will facilitate geothermal developers to commercially access these by-products, which is technically covered by a separate mining legislation.

In order to stimulate emerging technologies, government regulators should introduce differentiated economic incentive schemes for new technologies. Guidelines must also be developed for the inclusion of EGS and low enthalpy for inclusion in feed-in tariff rates that will provide guaranteed payment to RE investors through a universal charge. The government is still finalizing the RPS implementing rules and regulations. The RPS will be complemented by a feed-in tariff ("FIT") system, however, the FIT system under the *RE Act* has given priority connections to the grid for electricity generated from emerging RE resources to the exclusion of geothermal.

6. CONCLUSION

High energy prices and emissions legislation will make geothermal energy a competitive source of clean, sustainable energy in more global markets. Undoubtedly, the introduction of a new legislative and regulatory framework under the *RE Act* and technological and process improvements helped facilitate new geothermal investments in the Philippines. However, it is the mitigation of risks that will ultimately lead to widespread deployment of geothermal production as a power and heat source. Renewable energy efforts are directed at improving energy affordability as key objectives focusing on sustainable business and social models. Government must be unequivocal in easing ownership restrictions to foreign capital and exert more political will in its efforts to mitigate social and environmental concerns. Government policy should be open to fast-paced development of technology in providing the legal cover and additional incentives to private investors and ultimately induce the much-needed developmental growth. The government should also expand the efforts of multilateral and bilateral aid organisations to address economic and non-economic barriers, as renewables must often compete against 'hidden' subsidies for conventional fuels.

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