

PHILIPPINE GEOTHERMAL INDUSTRY UPDATES 2011

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ABSTRACT

Major developments and activities that have taken place in the Philippine geothermal industry during the past few years are more on the corporate and policy fronts. These include the takeover by Chevron Geothermal Philippines Holdings, Inc. (CGPHI) of Unocal Philippines' geothermal steamfield operations in 2005, full privatization of PNOC-EDC (now known as Energy Development Corp. or EDC) in late 2007, and the sale of National Power Corporation's (NPC) geothermal power plants in Tiwi and Makiling-Banahaw to Aboitiz Power Renewables, Inc. (APRI) in 2008, and the Tongonan I and Palinpinon I/II power stations to EDC in September 2009 as well as the whole Bacman power plant facilities to EDC in 2010. Furthermore, the Renewable Energy Bill was signed into law in late 2008, and went into effect in July 2009, providing legal definitions and financial and non-financial incentives to further develop all renewable sources of power, including geothermal.

The short and long-term future for geothermal energy development looks promising. Most of the expansion programs are back in the pipeline, and new players have entered the geothermal development scene. With all these in the horizon, plus the incentives embedded in the RE Act, the Philippines is looking forward to an even more vibrant geothermal energy sector in the years to come.

Keywords: Philippines, geothermal, privatization, expansion, RE Law

1. INTRODUCTION

As of the end of 2010, the installed (operating) geothermal capacity of the Philippines is at 1,624.89 MWe, generated from six of the seven operating geothermal steamfields (except Bacon-Manito which is currently undergoing major plant rehabilitation) across the archipelago (Fig. 1). The Philippine Department of Energy (DoE) oversees the exploration and exploitation of geothermal concessions in the country, while practically the whole geothermal industry is now run by private corporations from government-controlled entities. As a result of industry-wide privatization efforts, three (3) major players emerge in the redefined Philippine geothermal energy landscape. These are - a) Chevron Geothermal Philippines Holdings Inc. (CGPHI) who took over the geothermal steamfield operations of Unocal Philippines in Makiling-Banahaw (Makban) and Tiwi; b) Energy Development Corp. (EDC), which now owns and operates steamfield and power plant facilities at Leyte, Bacon-Manito (Bacman), Palinpinon, Northern Negros and Mindanao; and c) Aboitiz Power Renewables Inc. (APRI), owner and operator of the power plant assets of National Power Corp. (NPC) in Makban and Tiwi. In addition, several new players are now actively exploring a number of awarded concessions nationwide; activities here range from surface exploration surveys to preliminary development phase.

Installed power capacity of all geothermal plants in the Philippines makes up about 12% of the 15,991MWe total installed capacity in the country (Fig. 2), but contributes 17% of actual GWH generation. This is because of the very high average utilization factor of geothermal plants at 93.2%, ranging from 88% to 100%. These figures attest to the reliability of geothermal-power generators, and also reflect the lower electricity cost of geothermal compared with those powered by fossil fuel.

On the legislative and regulatory fronts, the Renewable Energy Act was signed into law in late 2008, and was duly in effect in July 2009. It is intended to spur development of geothermal and other renewable energy sources through a number of provisions which include the Renewable Portfolio Standard for utilities, promoting transmission access, and offering a range of tax and investment incentives.

This paper presents updates on geothermal development activities as well as the RE Law implementation.

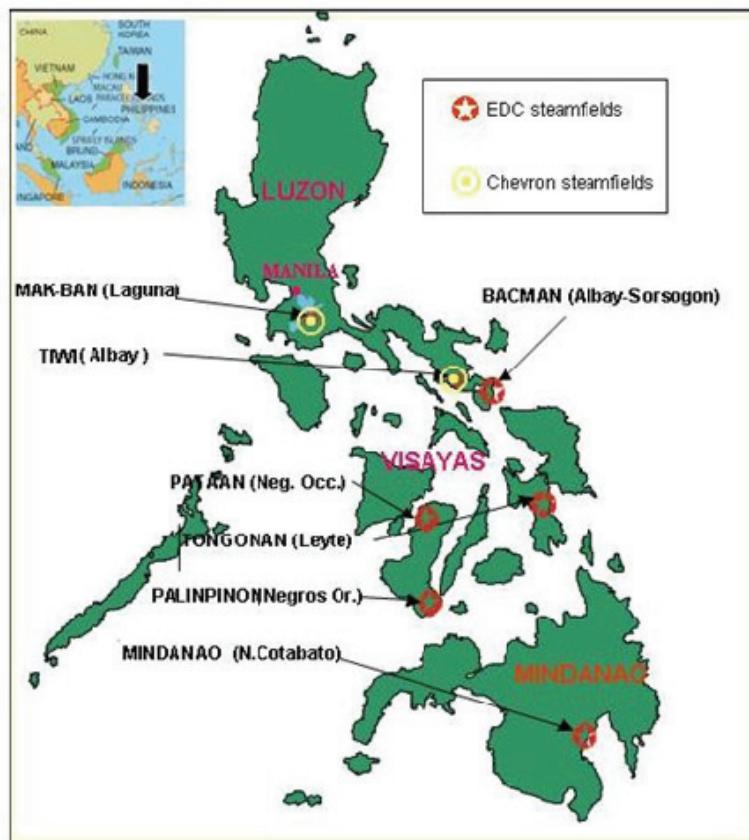


Figure 1. Location map of producing geothermal areas in the Philippines (Ogena, et al., 2010)

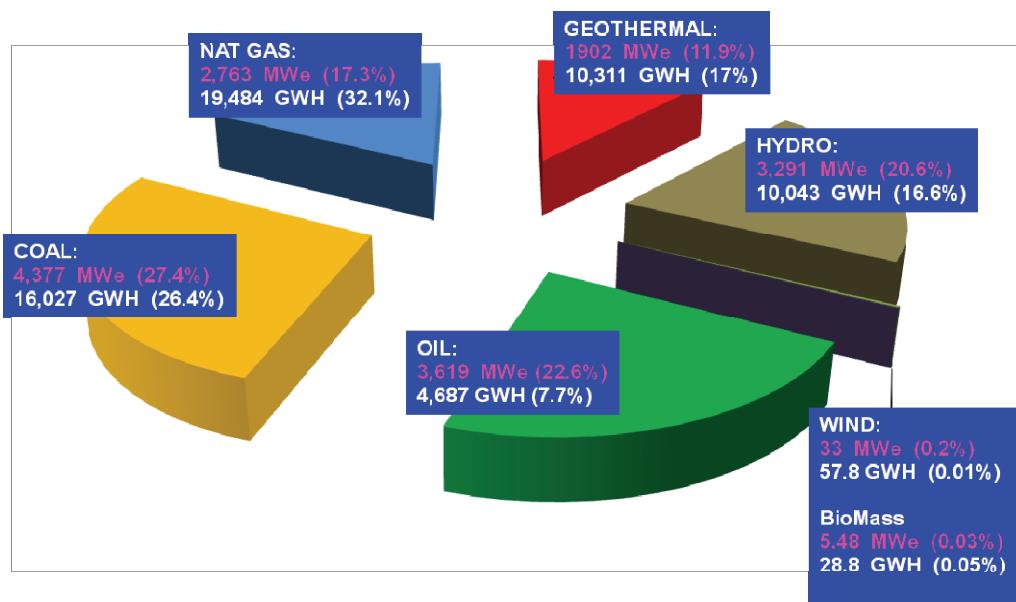


Figure 2. Philippine Energy Power Mix

2. CURRENT GEOTHERMAL OPERATIONS

CGPHI operations are limited to steamfield/resource management of the Makiling-Banahaw and Tiwi assets, while APRI operates the power plant facilities of both geothermal fields. EDC, on the other hand, owns and operates steamfield and power plant installations in its five concession areas. Summarized below are capacities of the 7 production fields in the country.

Table 1. Installed and generating capacities of geothermal power plants in the Philippines (after Ogena, et al., 2010)

AREA	OPERATOR	INSTALLED CAPACITY (MWe)	GENERATING CAPACITY (MWe)
Makiling-Banahaw	CGPHI / APRI	457.7	387
Tiwi	CGPHI / APRI	334	234
Tongonan	EDC	715.89	707.39
Palinpinon	EDC	192.5	183
Bacon-Manito	EDC	150	Ongoing rehabilitation
Mindanao	EDC	103.23	103.23
Pataan	EDC	41.37	10
TOTALS		2,044.69	1,624.89

Major rehabilitation works were performed by the National Power Corp. on the Mak-Ban and Tiwi power plants prior to its sale to APRI, thereby improving efficiency and capacities of the individual generating units.

EDC bid for, and won, ownership of all NPC-operated plants (on an as-is where-is basis) in its geothermal concessions; these include the 112.5MWe Tongonan plant, 112.5MWe Palinpinon I plant, and the combined 150MWe Bacman power plant complex. With this development, EDC has become a fully vertically-integrated geothermal operator, controlling both steamfield and power plant in all its concession areas. Rehabilitation work for Palinpinon I and Tongonan I plants have been completed, and these generators are now producing close to rated capacities. Major rehabilitation works are ongoing in Bacman I (110MWe) and Bacman II Cawayan (20MWe) plants; it is expected that before the end of the year these facilities will be onstream and producing at rated capacity. The Bacman II Botong module (20MWe), however, will no longer be rehabilitated; studies are currently being undertaken to determine the best way forward for the Botong sector of the Bacman resource.

The Northern Negros (Pataan) geothermal facility of EDC has been downgraded to 10MWe from its installed rating of 41.37MWe. Problems inherently related to resource characteristics have forced the downgrade. Technical studies are ongoing in Northern Negros to determine the optimum and sustainable development size for this geothermal system. Results of these studies should be ready by the middle of 2012.

3. FUTURE DEVELOPMENTS

Sources at the Philippine Department of Energy (DoE) (<http://www.doe.gov.ph>) state that the Department aims to increase the country's geothermal capacity by about 75% over the next 20 years; currently the number of committed and indicative projects now in the pipeline is estimated at over P200 billion. The additional geothermal capacity target is anchored on EDC's expansion program within its current service contract areas, and development from current exploration programs by new industry players. If all proposed geothermal projects push through, as much as 1,495MWe of geothermal power could be added to the national energy supply.

Of the 1,495MWe targeted, however, only 90MWe have been committed so far under three projects. Two are EDC expansion projects in Palinpinon (Nasulo Optimization, 20MWe) and Mindanao (Mindanao III, 50MWe). The former is targeted for commissioning by late 2012, while the latter is to be onstream by 2014. In a recent news article by Philippine print media, Maibarara Geothermal Inc. (MGI), which is the concession holder for the Maibarara geothermal area adjacent to Mak-Ban of CGPHI, announced the commencement of full 20MWe development of the Maibarara resource. A joint venture between PetroEnergy Resources Corp. (65%), Trans Asia Oil and Energy Development Corp. (25%) and Philippine National Oil Co. – Renewables Corp. (10%), MGI conducted workover operations and flow testing of 2 existing wells in Maibarara early this year, yielding a combined output of 15MWe. Target plant commissioning for Maibarara is late 2013.

Another EDC expansion project in the pipeline involves the Tanawon and Rangas sectors of Bacman. Two wells have been

drilled in Tanawon, and the estimated resource potential here is 50MWe. Although no step-out well has yet been drilled in Rangas, it is expected that this sector will be good for another 40MWe considering its proximity to the postulated upflow zone of the Bacman geothermal system. Target commissioning date for Tanawon-Rangas development is late 2016.

Other growth target areas eyed by EDC for development include Kayabon (estimated at 40MWe) within the Bacman service contract area, Dauin (40MWe) close to Palinpinon, and Cabalian in Southern Leyte (20-30MWe). If all projections come to bear, EDC's production fields' expansion and greenfield development projects will add 290-320MWe to the country's geothermal power capacity.

The last two or three geothermal contracting rounds resulted in the award of several exploration concessions to newcomers in the Philippine geothermal industry. These bid-out areas include Biliran Island off Leyte, Amakan in Compostela Valley Province, and Mabini in Batangas Province (Fig 3.). A few of the awarded geothermal prospects, Biliran and Amakan included, are in the advanced exploration stage – where exploration wells have been drilled and tested, and post-drilling evaluation has been conducted. Advanced exploration activities are now on-going in these sites; these exploration surveys are expected to lead to additional exploration drilling in the near future, hopefully leading to eventual field development and production.

A parallel effort on the part of DoE with respect to the awarded exploration concessions is the detailed and diligent review of accomplishments of all current holders of geothermal concessions. The objective of this exercise is to identify which awardees are on-track with respect to the work program they submitted during the bid round, and which awardees are delinquent with respect to work program accomplishments. From this identification process, there are plans to revoke concession awards to delinquent concession owners, with these concession areas to be re-bid in the geothermal contracting round immediately following the review. It is for this reason that the 2010 and 2011 contracting rounds have not been scheduled by the DoE pending the completion of their awarded concession technical review.



Figure 3. Geothermal prospects in the Philippines (after Ogena, et al., 2010)

4. THE RE LAW IMPLEMENTATION

The Renewable energy Act of 2008 is often dubbed as one of the most comprehensive and forward-looking RE laws in the world. It incorporates a number of fiscal and non-fiscal incentives for RE developers; among the significant non-fiscal incentives are the Feed-in-tariff (FiT), Renewable Portfolio Standard (RPS), net metering, green energy option, must/priority dispatch and RE trust fund. FiT refers to the RE policy that offers guaranteed payments on a fixed rate per kWh for RE generation, excluding any generation for own use; RPS is a market-based policy that requires electricity suppliers to source an agreed portion of their energy supply from eligible RE resources; Net Metering is a system in which a distribution grid user has a two-way connection to the grid and is only charged for his net electricity consumption and is credited for any overall contribution to the grid. With geothermal power production being an already-established RE source, the FiT will no longer cover geothermal development, at least the conventional type. The RPS, however, includes power fueled by geothermal technology.

The composition of the National Renewable Energy Board (NREB), the body tasked to oversee and champion the development of RE in the Philippines, was finalized and announced in late 2010. Now on its final phase of deliberation among the various technical working groups and subcommittees of the NREB are the various policy and regulatory mechanisms to speed-up the implementation of all aspects the law. The target effectivity of both FiT and RPS is before the end of the current year.

Since the signing of the Renewable Energy Act of 2008, a total of 206 contracts had so far been signed by the DoE. The primary target for renewable energy development is to double RE installed capacity for power generation at the end of the 20-year planning horizon from its 2008 level of 5,300MWe. Since geothermal is a comparatively more advanced RE resource, the targeted installed capacity will increase from 2,045 to over 3,000 MW at the end of the planning horizon to boost the country's leadership in geothermal energy development worldwide.

5. SUMMARY

Recent major changes in the geothermal industry in the Philippines have focused outside of technical and operational aspects, but rather on changes in the ownership and regulatory landscapes. Privatization efforts are regarded as a positive step for the industry, with the implementation of much-needed plant rehabilitation works to improve plant efficiency and dependable generation capacities. Enactment of the RE Law is seen as another positive step forward, towards the achievement of lofty goals set for RE in general and geothermal in particular. The immediate impact of these steps is the entry of new players in the realm of geothermal development, thereby accelerating the evaluation and development of geothermal potential areas in the country. The future of geothermal energy in the Philippines looks bright and lively with all these developments, and should translate to increased geothermal installed capacity, towards the road of global leadership in geothermal energy development.

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