



**UNITED NATIONS
UNIVERSITY**

GEOTHERMAL TRAINING PROGRAMME
Orkustofnun, Grensásvegur 9,
IS-108 Reykjavík, Iceland

30th Anniversary Workshop
August 26-27, 2008

PHILIPPINE GEOTHERMAL UPDATE 2008

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ABSTRACT

Geothermal resources, along with other renewable energy resources, are on centre stage in the Philippines as the country is endowed with such resources and utilization of the resource proves to be an advantage at the present time when oil price continues to soar in proportions that challenges the resiliency of the demand sector's capacity and serious concern on the environment solicits vigilance amongst stakeholders. Current programmes of the Government giving priority to development of indigenous and environmentally benign energy sources result in improved private sector and foreign participation in geothermal development. Geothermal investment interests are expected to bring new technologies and require an improved information campaign and good technical support.

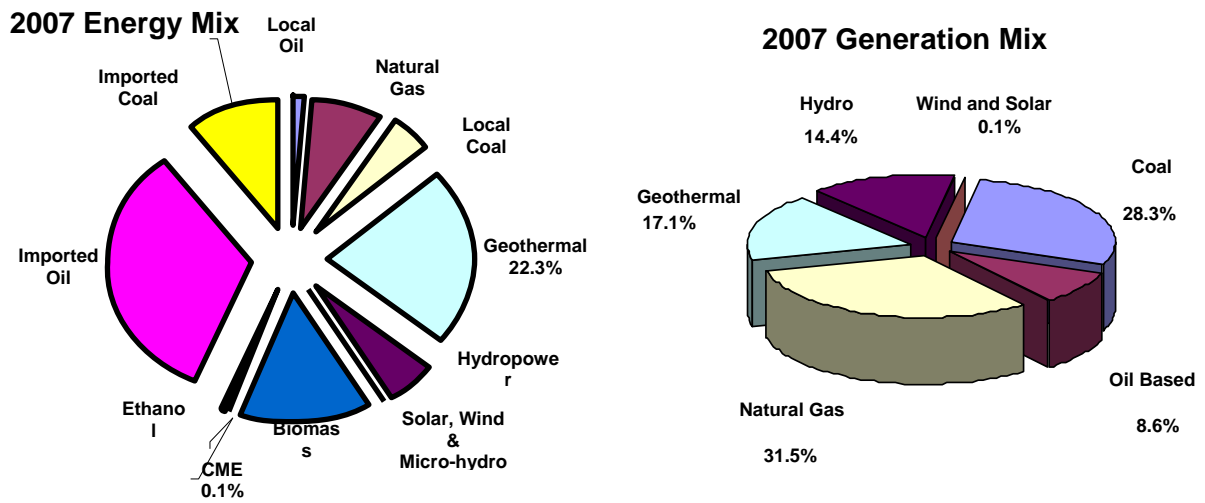
1. INTRODUCTION

The current world concern is soaring oil price and environmental preservation. The Philippines is no exception in the experience of the crunch from the oil price hike since the end of 2007, 36% of our energy demand is dependent on oil and 95% of this oil is imported. As everywhere around the globe, the country prepares to reduce oil consumption through development of indigenous energy resources, use of renewable and alternative energy sources and promotion of energy conservation and use of energy efficient systems. This provided the impetus for the aggressive promotion of our geothermal resources for development and utilization.

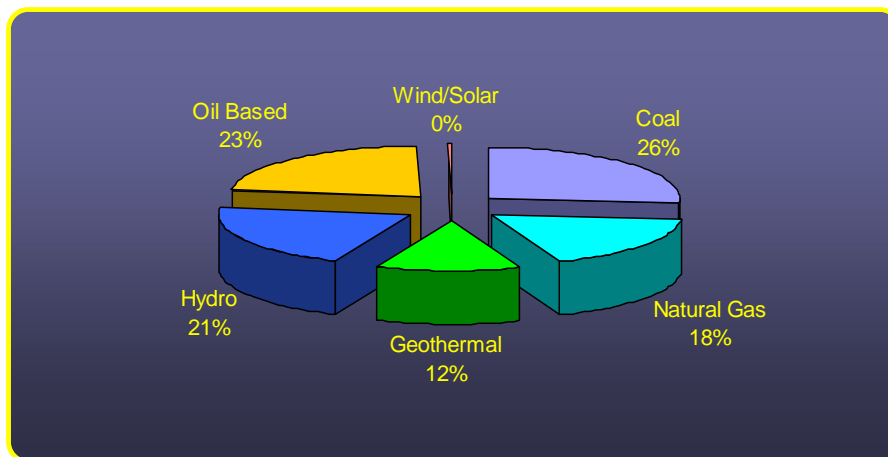
The Philippines actually had been active in the exploration and development of geothermal resources for 32 years now but the efforts are largely done by the Government through the government owned and controlled corporations, Philippine National Oil Company- Energy Development Corporation (PNOC-EDC) and the National Power Corporation (NPC). However, with the said developments in the world energy sector today, investments in geothermal development have become more attractive, such that interest from private groups has been increasing. Previous exploration of identified geothermal resources by the Government proved to have provided a less risky environment to possible investors on the development side.

2. SECTOR PERFORMANCE

The country's policy had long been to increase the self-sufficiency in energy even before the crisis that the world is facing currently in light of the soaring oil price. This is due to the lack of sufficient proven reserves of oil such that oil supply is largely imported, the condition being stressed during the power crisis experienced in 1993 due to disturbances in the oil industry. The vision on geothermal energy becoming an important part of the power sector had actually long been established as geothermal reservations were declared after a national inventory of thermal manifestations in 1964.



Self Sufficiency Level = 55.7%



2007 Capacity Mix

FIGURE 1: Graphic representation of energy, generation and capacity mix (Department of Energy, 2008a)

Each of these reservations now hosts geothermal power plants and their proof of reliability, viability and environmental soundness have created a continuous interest in geothermal development.

Geothermal energy grew to be a conventional energy source in the Philippines. In 2007, it provided 22% of the energy mix, 12% of the capacity mix and 17% of the generation mix. Last year's energy mix is dominated by oil, geothermal and coal. However, oil is 95% and coal is 70% imported, respectively. The accomplished 56% self-sufficiency in primary energy is largely due to geothermal energy utilization (Figure 1). In terms of total installed capacity, geothermal ranks fifth behind coal, oil, hydro and natural gas. Generation-wise, geothermal ranks third behind natural gas and coal. Natural gas supplies 30% of the total generation with a total installed capacity of 2,700 MWe compared to geothermal's 2,027 MWe. Nevertheless, this geothermal capacity sustains our rank as the world's second highest in geothermal energy production next to the United States.

3. SECTOR DEVELOPMENTS

3.1 Privatization

Under RA 9136, also known as the Electric Power Industry Reform Act of 2001 (EPIRA), the law sets privatization of at least 70% of National Power Corporation (NPC) assets in Luzon and Visayas to implement retail competition and open access. Currently undergoing privatization process are the NPC-owned geothermal generating assets Makban and Tiwi geothermal fields. Also lined up for privatization are the Tongonan, Bacman and Palinpinon geothermal assets. An integrated steamfield and power plant sale is preferred as per the provisions of the EPIRA.

PNOC-EDC as a corporation was wholly privatized on November 2007 through a bid round and through public offering of shares of stock.

3.2 The Philippine energy contracting round

Historically, the Philippine geothermal industry had been dominated by the PNOC-EDC while the two NPC-owned geothermal facilities remained to be operated by the then Philippine Geothermal Inc., a subsidiary of Unocal (now Chevron Geothermal Philippines Holding, Inc.).

Whereas before, the award of geothermal service contracts were on a “first come, first serve” basis, in 2003, the conduct of contracting rounds was tested for the award of petroleum service contracts with the assistance of Norwegian expertise. The round proved successful such that it became a yearly activity for the Department. The contracting experience was tested in the award of geothermal service contracts the following year in 2004. The exercise was started by offering expansion and optimization projects of PNOC-EDC contracted areas. While there were proposals received, negotiations for the farm-in failed. In 2005, the contracting round was launched for the three resources – petroleum, geothermal and coal. This time the round offered geothermal prospects for both power and non-power application. Again, the proposals received did not reach any conclusion. The latest bid round, however, produced three new geothermal service contracts (GSCs) including such a contract over Biliran Province where Icelandic investment through Geysir Green Energy and Reykjavik Energy is involved (Table 1). This development brought the total number of GSCs to eleven.

TABLE 1: Energy contracting round summary

| Year | No. of areas offered | Nature of area | Results |
|------|----------------------|---|---|
| 2004 | 10 | - 5 areas for expansion/ optimization of existing fields - 5 new areas for exploration and development | - |
| 2005 | 11 | - 7 new areas for exploration and development and 4 new areas for direct application | - |
| 2006 | 3 | - 3 new areas for exploration and development | Awarded geothermal service contracts to the 3 winning bidders |

While the existing round is wholly DOE-initiated, the Department is working on an amendment in the Contracting Round law (Department Order 2006-12-0014) to enable investor initiated contracting rounds. The supposed mechanism is the immediate launching of a bid round for every area nomination received. This will serve to expedite awarding of the GSCs.

3.3 The Renewable Energy Bill

The bill is announced as a priority of the president in her latest state-of-the-nation address. The bill passed the Congress on June 12, 2008 and is currently in the amendment stage at the Senate.

Salient features of the bill include the provision of the following aside from the usual incentives given in Presidential Decree 1442 which provides the guidelines for geothermal exploration and development (Department of Energy, 2008b).

Fiscal incentives

- Income tax exemption – first 6 years;
- Net operating loss carryover (NOLCO) – First 3 years;
- Accelerated depreciation;
- Exemption from the universal charge;
- VAT zero-rated on the sale of power generated from RE resources;
- Government share of at least 2% of the gross proceeds from the sale of geothermal steam.

Non-fiscal incentives

- *Renewable portfolio standards* - all stakeholders in the electric power industry are to contribute to the growth of the renewable energy industry in the country.
- *Feed-in tariff* is a mechanism applied to renewable energy generations used in complying with the renewable portfolio standards, that involves a fixed guaranteed price for each renewable energy system and/or technology over a period of at least 10 years, and shall be set at a higher price per kilowatt-hour than the grid price and finally, to be passed on directly to all electricity consumers.
- *Priority dispatch for intermittent resources* includes qualified RE generating units such as power plants utilizing hydro, wind, solar or ocean energy, shall enjoy priority dispatch subject to technical and financial feasibility considerations in accordance with the WESM rules and regulations.
- *Green energy option* shall provide end-users with a monthly average peak demand of at least 100 kW, the option to directly contract or choose renewable energy resources.
- *Net metering and distributed generation* – authorizes the distribution utilities to enter into net-metering agreements with qualified end users up to a distributed generation market share of one percent (1%) of peak distribution grid demand.
- *Off-grid renewable energy development programme* – the Small Power Utility Generation (SPUG) division of NPC, successors-in-interest and/or qualified third party in off-grid areas shall, within two (2) years from the affectivity of this act, source a minimum percentage of its total annual generation from available RE resources in the area concerned, as may be determined by the DOE through its Renewable Energy Policy Framework.

3.4 Promotion for direct use application

The Government implements a local study assessing the low-enthalpy geothermal resources to determine the possible direct applications of the geothermal resource for cascade use industries and to determine the viability of new technologies that can produce power from such low-enthalpy geothermal resources.

A guideline for the utilization of geothermal resources for direct non-power use is being drafted to complement the study.

4. CHALLENGES

4.1 Technology

Some geothermal prospects, even contracted, are left undeveloped due to constraints in technology such as addressing an acidic geothermal system or such system that lacks permeability. Another challenge in the area of technology is the optimization of geothermal resource utilization through the implementation of cascade-use projects and development of low-enthalpy geothermal fields.

4.2 Environmental/social

It is our experience that the areas for resource development activities are growing smaller and smaller as areas are being secured for environmental purposes through the establishment of protected areas. Even outside these environmental reservations, some local people and cause-oriented groups are very vigilant in opposing development activities that would entail environmental disturbances. Nevertheless, with a sufficient information campaign and strong government support, projects still get through.

Some challenges may also be encountered in implementing projects within ancestral domains. The process of getting the free, prior and informed consent (FPIC) of the indigenous peoples involves a field-based investigation and consensus-building activities to get memorandum of agreements with the indigenous peoples group. The intensity of the challenge varies from place to place.

4.3 Technical expertise

A review of the whereabouts of UNU-GTP fellows shows that a good number of the fellows have retired and some have already migrated to other countries. As new players come into the geothermal sector, there would be increased need for geothermal experts for regulatory, implementation and assessment purposes as well as for the conduct of research. Then PNOC-EDC (now Energy Development Corporation or EDC) may have a different mandate compared to such a time when it was still a government owned and controlled corporation.

5. CONCLUSIONS

- The Philippines have been consistent with its thrust to prioritize geothermal development, branding it as a reliable, environmentally benign and cost effective energy alternative to oil.
- The resource is gaining popularity among investors in view of the aggressive stance on the preservation of the environment and finding relief from the soaring oil price such that new players come in and more are inquiring about promising areas for the renewable geothermal resource.
- The contracting round proved to be an effective system to attract new investors to provide not only investments but also advanced technology.
- Geothermal projects are generally socially acceptable. However, there are cases when geothermal resources are located within protected areas and ancestral domains where getting the consent to operate the resource becomes difficult.
- A new pool of geothermal experts needs to be developed soon in light of new geothermal contracts and expected applications to be received in the near future.

REFERENCES

Department of Energy, 2008a: *Philippine energy plan 2008-2014*

Department of Energy, 2008b.: *Renewable energy bill, 2008*