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A New Law for the Geothermal Industry in the Philippines

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ABSTRACT

The present industry policy which governs geothermal energy development in the Philippines seems to be unfavorable to attract private sector participation. This is evident in the presence of only two field developers since geothermal exploration begun in the 1970s. The current fiscal incentives being enjoyed by these developers are not enough to warrant continuous sustainable exploration and development of this resource. Presidential Decree 1442, which was signed in 1978, institutionalized the Geothermal Service Contract scheme between the government through the Department of Energy and the interested field developer. Under the scheme, the State owns the resource and has full control and supervision over the exploration, development and utilization of geothermal resource which may directly undertake such activities or enter into a co-production, joint venture or production sharing agreements. The system provides for the development and exploitation of the resource for 25 yrs. extendible for another 15 yrs. while exploration period is negotiable. It is, therefore, the purpose of this paper to determine the impacts and applicability of the present law on geothermal development and the need to pass a new legislation that will provide better incentives for the development of indigenous energy resources such as geothermal.

1. INTRODUCTION

Geothermal energy development in the Philippines has grown tremendously over the past twenty (20) years. From a mere 3 MWe installed capacity in 1977, the country has 1930.89 MWe of installed geothermal power capacity as of end of 2003. This was made possible amidst the absence of new players in geothermal field development.

Since its inception, there are only two field developer in the Philippines - Philippine National Oil Company - Energy Development Corporation (PNOC-EDC) and Philippine Geothermal Inc. (PGI). Geothermal development has been undertaken under a regulatory framework in Presidential Decree (PD) 1442 otherwise known as “An Act To Promote The Exploration and Development Of Geothermal Resources ". This was issued to accelerate geothermal energy development and to attract private sector investment. Although geothermal development had contributed at an average of 20% in the power generation of the country in the past 20 years, the incentives had proven to be unattractive, as only two developers remain active in the geothermal development sector.

Our present system is not attractive to prospective investors basically due to the unfavorable rate of return on their investments. To hasten the exploration and development of our geothermal resources, we need to provide an environment that will attract investments, thus the proposed legislative measure offers a package of incentives, both in fiscal and contractual arrangements.

2. PRESENT STATUS OF GEOTHERMAL DEVELOPMENT

The Philippines remains the second largest producer of geothermal energy for power generation (Table 1). To date, the country has nine (9) geothermal service contract areas, six (6) of which are producing fields and three (3) are under advance exploration stage. Among the producing fields, four (4) are operated by PNOC-EDC - a subsidiary of PNOC that was mandated by the Government to undertake accelerated development of indigenous energy resources. The other two are operated by PGI - a local subsidiary of Union Oil Of California (UNOCAL), under an interim agreement with National Power Corporation (NPC) following the expiration of their service contract on September 1996 (Table 2). As of end of 2003, the total installed generation capacity now stands at 1930.89 MWe, with the largest installation at Tongonan, Leyte (722.68 MWe). This was made possible through the implementation of the Build-Operate-Transfer (BOT) scheme. This has been the major component in realizing the recent geothermal development expansion program. The BOT law allowed the entry of international power utilities to fund, construct and operate geothermal power plants thus increasing the much needed electrical generation without increasing our national debt.

The BOT legislation was also responsible for the installation of 108.48 MWe Mindanao Geothermal Power Projects located at Kidapawan, North Cotabato (Table 3).

A cumulative total of 9,419.02 gigawatt-hour (GWh) of electricity were generated by the geothermal power plant at the end of 2003, which is about 19.10% of the power mix for the year. This has saved the country from about 16.24 million barrels of fuel oil equivalent (MMBOFOE) translated to MM US$ 454.71 in foreign savings based on an average price of US$ 28 per barrel of oil (Table 4).

To maximize the utilization of geothermal energy, reconnaissance geological and geochemical surveys were conducted by the Department Of Energy (DOE) while exploration activities are continuously undertaken by PNOC-EDC and PGI that will identify new potential areas.

Being considered as a renewable energy, the DOE is targeting for the next ten years the installation of an additional 1,200 MW of geothermal capacity. This is in support of the Renewable Energy (RE) development goals of increasing RE-based capacity by 100 percent by 2012 and increasing non-power contribution of RE to the energy mix by 10 MMBFOE. The attainment of this target is also being pursued as a strategy to maintain, if not improve, the

Philippines' ranking as the second largest geothermal producer in the world.

To attain this ambitious goal, the DOE launched in Manila on March 11, 2004 the First Philippine Geothermal Contracting Round (GEOTHERMAL 1), a special event aimed at promoting investment opportunities in the Philippine geothermal energy industry. This public contracting round offers ten areas for contract/joint venture application – one project for steam field optimization (20 MW), three projects in the development of new sectors within existing geothermal contract areas (20 – 80 MW), and projects for the exploration and development of six greenfield areas (20-110 MW). In GEOTHERMAL 1, the DOE introduces a different approach on granting of new Geothermal Service Contracts. Through this more transparent and competitive approach, interested investors are given easy access to all available technical data.

A sustained public awareness campaign will be conducted in preparation for the expected increased private sector investments in geothermal projects to improve their acceptability in host communities, which demand that environmental and social concerns be addressed.

3. PRESIDENTIAL DECREE (PD) 1442 – THE GEOTHERMAL LAW

In order to accelerate the development of geothermal resources, which have been identified as a viable source of energy and to reduce our dependence on imported energy supplies, PD 1442 was signed into law by then President F.E. Marcos in 1978. This institutionalized the Geothermal Service Contract (GSC) scheme between the DOE and the interested field developer. A GSC is awarded through a public bidding or through negotiation with a domestic or foreign company who must be technically and financially capable of undertaking the operations. However, this foreign company must have at least 60% Filipino participation. Under the scheme, the State owns the resource and has full control and supervision over the exploration, development and utilization of geothermal resource which may directly undertake such activities or enter into a co-production, joint venture or production sharing agreements. The system provides for the development and exploitation of the resource for 25 yrs. extendible for another 15 yrs. while exploration period is negotiable; provided that if the contractor has not been in default in its obligation under the GSC, the DOE may grant an additional extension of 15 yrs.

In practice, the incentives provided by PD 1442 have proven to be unattractive to private sector investment. This is clearly evident as PNOC-EDC is the only service contractor that is active in the Philippine geothermal development program.

4. IMPACTS OF PD 1442 TO GEOTHERMAL DEVELOPMENT

It has been widely acknowledged that certain provisions of the Geothermal Law especially that of production sharing agreement has been adopted from the Oil and Gas Law (PD 87) and presently in force for the geothermal service contract system. PNOC-EDC considered this as a heavy burden for their existing operations and an effective deterrent for their future project.

According to PNOC-EDC, the 60-40 agreement in the current geothermal law is intrinsically flawed based on the following considerations:

a. Unlike petroleum, coal or natural gas, extraction of geothermal energy involved drilling of both production and reinjection wells to ensure that the resources withdrawn are reinjected back to earth. It also involves watershed management to ensure forest cover to conserve water resource. These make exploitation of geothermal energy more expensive than oil and gas.

b. The exploitation/utilization of geothermal energy is similar to hydro resources and it simply involves the removal of heat from water and returning back the water to the reservoir. This is similar to hydro resources, which are fully exempted from the payment of taxes, duties, fees, levies and other imposts. Moreover, geothermal resources should not be classified like oil, coal or natural gas which are deemed physically and permanently removed from the earth and are commercially traded both for energy and non-energy projects.

c. Unlike in the case of oil where there exists a global marketing network, geothermal is not so traded and special marketing arrangements, of which transfer pricing is a key component, have to be negotiated and established for each project.

By comparison, Indonesia's production sharing agreement for geothermal is only 38% of net income plus income tax compared to the Philippines' government share of 60% of net income. Furthermore, under PD 76 of 2000 on geothermal exploration for electric generating purposes, the Indonesian Government bears the risk of exploration failure when such exploration does not result in a well of sufficient potential. This maybe the reason why UNOCAL, the parent company of PGI, is investing heavily in geothermal projects in Indonesia than in the Philippines.

Moreover, a study by the former Geothermal Division of DOE reveals that reducing the government share in the net proceeds of the geothermal operation from 60% to 40% in increments of 5%, showed corresponding increase in the contractor IRR by around 0.5% per increment, such that IRR improves from 9.44% to 11.47% respectively (Table 6). The results were analyzed through undiscounted cash flow analysis of a standard 110 MWe geothermal project.

5. A NEED FOR A NEW LEGISLATION

With the present system, investors are not attracted to venture in geothermal development projects due to the unfavorable return for their investments. Likewise, to further accelerate the development of geothermal sector in the Philippines, the industry have been advocating for changes in the existing legal framework of PD 1442 and the granting of additional fiscal incentives consistent with the governments fiscal policies.

Since early 1990's, several bills had already been proposed in Congress for the amendments of PD1442, unfortunately, this has been overrun by the change in administration.

The proposed bill entitled "Indigenous Energy Resources Act" is an independent piece of legislation that would provide additional incentives for the development of indigenous energy resources including geothermal, petroleum and coal (Table 7). This is an amendatory measure to the existing laws (PD 1442, PD 87 & PD 972) and to further promote the discovery, exploration, development, production and utilization of conventional

energy resources with the context of sustainable development.

The incentives and privileges adopted in the draft bill include the following:

a. Provisions Common to Geothermal, Petroleum and Coal

1. *Cross Recovery Allowance (CRA)*

This is equal to the share of the interest holder in any geothermal exploration costs incurred outside the contract area anywhere in the Philippines, which are attributable to another geothermal service contract, technical and financial assistance contract or geothermal exploration contract or permit which did not result in any discovery of the resource. Such geothermal exploration costs shall only be recovered from a new project within the first ten (10) years of steam production.

2. Cross recovery allowance among geothermal, petroleum and coal operations is authorized.

3. *Filipino Participation Incentive Allowance (FPIA)*

This is equivalent to seven and one-half percent (7.5%) of the gross proceeds for Geothermal Service Contract with a minimum participating interest of twenty-five (25%) in the contract area.

4. *Allowable Recoverable Costs (ARC)*

This shall consist of the exploration costs, development costs, operating costs, development uplift allowance and, if applicable, the cross recovery allowances and the contributions to the sinking fund. The sum of FPIA and ARC if availed, shall not exceed ninety percent (90%) with carry forward of recovered costs.

b. Geothermal Provisions

1. *Nature of Contracts*

The government may award three (3) contracts:

Geothermal Exploration Contract (GEC)

For carrying out geoscientific surveys with option to enter into a geothermal ser\vice or technical and financial assistance contract. Said contract shall have a term of three (3) years. Minimum work commitments of at least US$100/hectare over 3 years, provided that the contractor may, at his option, drill exploration wells during the period. Any well drilled under this contract can be credited to the work obligations under a geothermal service or technical and financial assistance.

Geothermal Service Contract (GSC)

The contractor has the exclusive right to conduct geothermal operations within the contract area and a stipulated service fee based on the sale or use of geothermal resources. It shall provide all the necessary financing, technology and management. The term of the contract shall be for a period of twenty-five (25) yrs. and renewable for another 25 yrs.

Provisions of the contract includes:

- Fixed service fee equivalent to 40% of the net proceeds
- Six yrs. tax incentives as provide by Omnibus Investments Code of 1987
- Eight yrs. holiday on production royalties starting from the seventh year, however, LGU share shall be paid continuously
- Providing for a FPIA equivalent to 7.5% of the gross proceeds
- Cost recovery ceiling (inclusive of the development uplift allowance, cross recovery allowance and contribution to sinking fund) together with the FPIA should not exceed 90% of the gross value in any year with carry forward of unrecovered costs
- Development uplift allowance of 60%
- Accelerated depreciation of capital investment

Geothermal Technical and Financial Assistance Contract (GTFAC)

Under this contract, the contractor has the exclusive right to conduct geothermal operations within the contract area over the period of 25 yrs. renewable for another 25 yrs. The contractor shall provide the necessary technology, financing and management at his sole expense and risk and is entitled to benefit from the use and sale of the geothermal resources after accounting to the Government for the gross revenue derived from the geothermal operations.

The provisions applicable to the GSC shall apply to this contract, except the provisions for the GSC excluding:

- Negotiated share (flexible gov't. share)
- Ten-year depreciation period
- Income tax paid by the contractor

The DOE is likewise pushing for the Renewable Energy Bill, which proposes to further promote the development, utilization and commercialization of RE resources, which include geothermal, hydro, solar, wind, ocean, biomass and other emerging energy sources.

The bill provides for a framework for the implementation of the RE program including support to non-power uses of RE

systems. It likewise includes, among others, the following key features:

- Green pricing mechanism to promote consumer choice of power supply
- Allocation of a minimum amount of generation capacity from RE
- Promote the use of hybrid systems
- Provision of financial and fiscal incentives to developers and implementors
- Conduct of sustained information campaign on RE

By providing incentives for the development of indigenous energy resource such as geothermal, it is expected that competition and accountability of industry participants to achieve greater operational and economic efficiency will be promoted. It will enhance the inflow of the much needed private capital and broaden the ownership base of steam field developers as well as power plant operators.

5. CONCLUSIONS

To hasten the exploration and development of our geothermal resources, we need to provide an environment that will attract investments. The proposed legislative measure under the "Indigenous Energy Resources Act", offers a package of fiscal incentives and contractual arrangements. The Cost Recovery Allowance will allow for the recovery of exploration costs in unsuccessful areas, thus reducing the contractor's exploration risk. The Filipino Participation Incentive Allowance will effectively accelerate cost recovery and at the same time reduce the income tax and royalty base. The 6 yrs. income tax holiday will reduce the project payback period while the 8 yrs. royalty holiday will significantly improves the geothermal service contractors' cash flow. Overall, the provisions included in the proposed draft legislation translates to an increased of about 5%-8% rate of return on investments. Similarly, better incentives are embodied in the Renewable Energy Bill. It shall give preference to the development and utilization of renewable energy resources, including geothermal and technologies in view of its environmental and social objectives.

Hopefully the bills drafted by DOE shall be passed to stimulate investment opportunities by the private sector in the exploration and development of new geothermal steam fields, as there are a lot of other geothermal prospects awaiting development.

We expect geothermal energy, being a renewable resource, to continue as a significant contributor to the Philippines energy and livelihood sector in the following years.

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Table 1. World Installed Geothermal Plant Capacities

COUNTRY	1990	1995	2000
USA	2774.60	2816.70	2228.00
PHILIPPINES	891.00	1191.00	1930.89*
ITALY	545.00	631.70	785.00
MEXICO	700.00	753.00	755.00
INDONESIA	144.75	309.75	589.50
JAPAN	214.60	413.70	546.90
NEW ZEALAND	283.20	286.00	437.00
ICELAND	44.60	50.00	170.00
EL SALVADOR	95.00	105.00	161.00
COSTA RICA	0.00	55.00	142.50
NICARAGUA	35.00	70.00	70.00
KENYA	45.00	45.00	45.00
GUATEMALA	0.00	33.40	33.40
CHINA	19.20	28.78	29.17
RUSSIA (Kamchatka)	11.00	11.00	23.00
TURKEY	20.60	20.40	20.40
PORTUGAL (The Azores)	3.00	5.00	16.00
ETHIOPIA	0.00	0.00	8.52
FRANCE (Guadeloupe)	4.20	4.20	4.20
GREECE	2.00	2.00	2.00
THAILAND	0.30	0.30	0.30
AUSTRALIA	0.00	0.17	0.17
ARGENTINA	0.67	0.67	0.00
TOTAL	**5833.72**	**6832.77**	**7997.95**

*As of December 2003
Source: IGA internet edition, 2003

Table 2. Geothermal Service Contract Areas

CONTRACT AREA	DATE AWARDED	ARE COVERAGE	STATUS	CONTRACTIING PARTIES
Tiwi, Albay	September 10, 1971	17,661 Has.	Producing	NPC-PGI
Mak-Ban, Laguna	February 21, 1973	162,000 Has.	Producing	NPC-PGI
Tongonan, Leyte	May 14, 1981	107,625 Has.	Producing	DOE-PNOC-EDC
Palinpinon, Negros Oriental	October 16, 1981	133,000 Has.	Producing	DOE-PNOC-EDC
Bac-Man, Sorsogon/Albay	October 16, 1981	31,300 Has.	Producing	DOE-PNOC-EDC
Mt. Apo, North Cotabato/Davao	March 24, 1992	701 Has.	Producing	DOE-PNOC-EDC
Mt. Labo, Camarines Norte/Sur	March 14, 1994	9,334 Has.	Under Dev.	DOE-PNOC-EDC
Northern Negros, Negros Occidental	March 24, 1994	4,310 Has.	Under Dev.	DOE-PNOC-EDC
Mt. Cabalian, Southern Leyte	January 13, 1997	4,200 Has.	Under Dev.	DOE-PNOC-EDC

Table 3. Producing Geothermal Fields of the Philippines

FIELD	POWER PLANT INSTALLED CAP (MWe)	STEAMFIELD DEVELOPER
Tongonan	722.68	PNOC-EDC
Mak-Ban	425.73	PGI
Tiwi	330.00	PGI
Palinpinon	192.50	PNOC-EDC
Bac-Man	151.50	PNOC-EDC
Mindanao	108.48	PNOC-EDC

Table 4. Philippines Geothermal Energy Performance

YEAR	GEOTHERMAL POWER PLANTS INSTALLED CAP. (MWe)	GENERATION (GWh)	FUEL OIL DISPLACED (MMBFOE)	AVE. OIL PRICE IN US$/BARREL	FOREIGN SAVINGS (MM US$)
1977	3	1	0.00	11.33	0.02
1978	3	3	0.01	12.32	0.06
1979	278	636.94	1.10	18.19	19.98
1980	446	2044.85	3.53	29.79	105.03
1981	501	3569.19	6.15	33.86	208.37
1982	509	3563.86	6.14	32.80	201.54
1983	784	4081.98	7.04	28.63	201.49
1984	894	4531.46	7.81	27.89	217.90
1985	894	4952.18	8.54	26.61	227.20
1986	894	4577.30	7.89	13.06	103.07
1987	894	4521.97	7.80	16.97	132.31
1988	888	4845.91	8.36	13.53	113.04
1989	888	5308.66	9.15	16.15	147.82
1990	888	5464.76	9.42	25.00	235.55
1991	888	5759.98	9.93	18.04	179.16
1992	888	5696.80	9.82	18.08	177.58
1993	1018	5667.25	9.77	16.00	156.34
1994	1074	6319.69	10.90	15.82	172.37
1995	1194	6134.52	10.58	16.60	175.57
1996	1448	6538.73	11.27	18.65	210.25
1997	1819	7430.88	12.81	18.27	234.07
1998	1861	8951.61	15.43	12.24	188.91
1999	1909	10367.95	17.88	17.45	311.93
2000	1909	11317.19	19.51	27.36	533.86
2001	1931	10381.03	17.90	23.48	420.25
2002	1931	10248.04	17.67	25.00	441.73
2003	1931	9419.02	16.24	28.00	454.71
TOTAL		152,335.67	262.65		5,570.12

Table 5. Salient Features of PD 1442

INCENTIVES	
Cost Recovery Ceiling (% of gross proceeds)	90%
Share of net proceeds	60%
Government	40%
Contractor	
Exemption from payment of taxes	All taxes
	(Except income tax w/c is
	Paid by the gov't. from
	Gov't. share)
Exemption from payment of tariff duties and	Applicable
Compensating tax on importation	
Depreciation of capital equipment	10 yrs. straight line
Entry of alien technical and specialized	Applicable
Personnel (including immediate members	
Of the family)	
Easy repatriation of capital investment and	Applicable
Remittance of earnings	
Expected contractor's IRR	5% - 11%

Table 6. Results of analysis with reduced percent government share.

GOVERNMENT SHARE	CONTRACTOR IRR, %	GOVERNMENT SHARE TOTAL	GOVERNMENT SHARE NPV	CONTRACTOR CASH FLOW TOTAL	CONTRACTOR CASH FLOW DISCOUNTED
60	9.44	246	36	164	-3
55	10.00	225	33	184	0
50	10.52	205	30	205	3
45	11.01	184	27	225	5.9
40	11.47	164	24	246	8.9

Table 7. Comparison of salient features of PD 1442 vs. Proposed Indigenous Resources Act

	PD 1442	PROPOSED INDIGENOUS ACT GSC	PROPOSED INDIGENOUS ACT GTFAC
Cost recovery ceiling	90%	90%	100%
(% of gross proceeds)			
Share of net proceeds			
Government	60%	60%	Not
Contractor	40%	40%	Applicable
Filipino Participation	None	7.5%	Not
Incentive Allowance			Applicable
(% of gross proceeds)			
Development Uplift Allow.	None	60%	Not
(% development cost)			Applicable
Cross recovery of exploration	None	Allowed w/in the first	Not
Cost in abandoned areas		Ten yrs of steam	Applicable
		Production	
Royalty holiday	None	8 yrs (starting on the	Not
		7th yr of steam	Applicable
		Production	
Incentives provide under the	Not	Applicable (including	Not
Omnibus Investment Code	Applicable	6-yr income tax	Applicable
Of 1987		Holiday starting on	
		The 1st yr of steam	
		Production	
Depreciation of capital	10 yrs straight	Accelerated	Accelerated
Investment	Line		
Exemption from payment	All taxes (except	All taxes (except	Pay income
Of taxes	Income tax)	Income tax)	Tax