COGEN 3

Proven, Clean & Efficient Biomass, Coal, Gas Cogeneration

The EC - ASEAN Business Facilitator

National Energy Policy Review

Philippines

December 2003

Carl Bro Intelligent Solutions

COGEN 3

Proven, Clean & Efficient Biomass, Coal, Gas Cogeneration

The EC - ASEAN Business Facilitator

National Energy Policy Review

Philippines

Prepared by EC-ASEAN COGEN Programme (COGEN 3)

COGEN 3 Programme Management Unit
Asian Institute of Technology, Energy Building
Km. 42 Paholyotin Highway
Klong Luang, Phatumthani 12120, THAILAND
Tel. +66 2 524 5399. Fax +66 2 524 5396, Email: cogen3@cogen3.net, Web: www.cogen3.net

COGEN 3 European Focal Point
Carl Bro International AB
Carl Gustafs Väg 4
SE-205 09 Malmö, SWEDEN
Tel. +46 40 25 61 12, Fax +46 40 30 59 44, Email: efp@carlbro.se

COGEN 3

Proven, Clean & Efficient Biomass, Coal, Gas Cogeneration

The objective of COGEN 3 is to promote the use of proven, clean and efficient cogeneration using biomass, coal or gas as fuel. This is achieved through partnership between ASEAN industries and European equipment suppliers.

The programme is co-ordinated in ASEAN by the Asian Institute of Technology (AIT), Bangkok, Thailand and in Europe by Carl Bro International, Sweden. COGEN 3 started its operation in January 2002 and will continue until December 2004.

Carl Bro Intelligent Solutions

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

List of Abbreviations

ASEAN	Association of South East Asian Nations
BOI	Board of Investment
BOT	Build-Operate-Transfer
CDM	Clean Development Mechanism
DOE	Department of Energy
DTI	Department of Trade and Industry
DENR	Department of Environment and Natural Resources
EO	Executive Order
EPIRA	Electric Power Industry Reform Act
ERC	Energy Regulatory Commission
GDP	Gross Domestic Product
GENCO	The Generation Company
GRAM	Generation Rate Adjustment Mechanism
GRIPP	Green Renewable Independent Power Producer
ICERA	Incremental Currency Exchange Rate Adjustment
IPP	Independent Power Producer
LRAC	Long-run Avoidable Cost
MC	Management Contract
MERALCO	Manila Electric Railroad and Light Company
NEA	National Electrification Administration
NEDA	National Economic and Development Authority
NPC	**OR** Napocor, National Power Corporation
NRE	New and Renewable Energy
PD	Presidential Decree
PEP	Philippine Energy Plan
PPA	Power Purchase Agreement
PPA	**ALSO** Purchased Power Adjustment
PPP	Purchasing Power Parity
PSALM	Power Sector Assets and Liabilities Management
RA 9136	Republic Act
RE	Renewable Energy
SPEED	Special Program to Enhance Electricity Demand
SPP	Small Power Producer
SPUG	Strategic Power Utilities Group
TDP	Transmission Development Plan
TRANSCO	National Transmission Company
WESM	Wholesale Electricity Spot Market

List of Energy Units

BCF	Billion cubic feet
BOE	Barrel of Oil Equivalent
GJ	Giga Joules
Kcal/kg	Kilo Calories per Kilogram
kV	kilo Volt
kWh	Kilowatt-hours
MT	Mega tonnes
MWh	Megawatt-hour
MVA	Mega Volt – Amperes
TSCF	trillion standard cubic feet
TJ	Terra Joules
TWh	Terra Watt-hours

Executive Summary

The Philippines is yet to have a National Policy on cogeneration. Any effort in this direction is always presented as a part of the Renewable Energy Policy framework. These policies have been formulated to achieve supply security and reliability, energy affordability and accessibility, environmental quality and finally consumer protection. Embarking on the energy efficiency and conservation policies, the Philippine energy sector has come up with the 2004-2013 Philippine Energy Plan (PEP) which asserts the energy sector's continuing commitment to the macroeconomic goals of the present Administration to promote balanced economic growth, alleviate poverty and foster a market-based industry. Given the constant power shortages and heavy dependence on fossil fuels, energy conservation has become one the top priorities in Philippines.

Policy making responsibility is held with the Philippine Congress with specific functions and programs identified to be implemented by the Department of Energy. This includes the execution of the electric power industry reform, the privatisation of the National Power Corporation, and the rationalisation of rural electrification development. The Department of Energy was created to prepare, integrate, coordinate, supervise and control all plans, programs, projects and activities of the Government relative to energy exploration, development, utilisation, distribution and conservation.

Supporting the cause of pursuing cleaner and efficient energy utilisation and clean energy technology applications as set up by the Department of Energy, cogeneration finds itself being promoted under this jurisdiction. There are no specific policies targeting cogeneration but an impetus on promoting and usage of renewable energy resources, indirectly supports it. Also the fact that Philippines is the second largest producer of Geothermal power, further importance is given by the Government to support geothermal energy resources having a consequence on cogeneration promotion.

An installed cogeneration capacity of 345 MW, in 1995 was established in 11 industrial sectors consisting of 63 such facilities and sugar industry accounted for about 57% of them. It is also a fact in Philippines that there are no cogeneration facility available as yet in any of the sugar mills and the rice husk produced is left to waste without being used for any specific purpose.
There are an estimated 300 operational biogas units of varying capacity, both industrial and household scale, in the Philippines. The latest cogeneration installations are

1. the 50MW Victorias Cogeneration Project, Negros Occidental of the Victorias Bioenergy Inc. and
2. the 30 MW First Farmers Cogeneration Project in Talisay City, Negros Occidental of the Talisay Bioenergy, Inc.

The policy makers of the Department of Energy have widely expressed their inability to get enough information on cogeneration let alone formulate policies in this regard. The potential industries with cogeneration possibilities also lack information on the benefits of cogeneration and the possibility of efficient usage of waste generated as in the case of sugar mills and rice mills.

1. Introduction

In 1998 the Philippine economy - a mixture of agriculture, light industry, and supporting services - deteriorated as a result of spill over from the Asian financial crisis and poor weather conditions. Growth fell to 0.6% in 1998 from 5% in 1997, but recovered to about 3% in 1999, 4% in 2000 and it is forecasted to be 4.5% in 2004. The government has promised to continue its economic reforms to help the Philippines match the pace of development in the newly industrialised countries of East Asia. The strategy includes improving infrastructure, overhauling the tax system to bolster government revenues, furthering deregulation and privatisation of the economy, and increasing trade integration with the region.

Table 1.1: Economic Figures – compared to other ASEAN countries.

Countries	Purchasing power parity (PPP) $	Real GDP Growth %		Per Capita PPP $	GDP per Sector		
		2003	2004		Agriculture %	Industry %	Services %
Cambodia	18 billion	5.0	5.5	1500	50	15	35
Indonesia	663 billion	3.5	4.0	3100	17	41	42
Malaysia	210 billion	4.2	5.1	9300	12	40	48
Philippines	**356 billion**	**4.0**	**4.5**	**4200**	**15**	**31**	**54**
Singapore	105 billion	2.2	4.2	24000	Negl.	33	67
Thailand	429 billion	5.2	5.5	6900	11	40	49
Vietnam	168 billion	6.9	7.1	2100	25	35	40

Source: Asian Development Bank and World Bank Yearly Report for Year 2002

2. General Overview of the Energy Sector

The Philippine Energy Sector is governed by the Medium Term Economic Development Plan of the country covering three major priority areas: 1) sustained economic growth; 2) social equity and poverty reduction; and 3) market-based industry. In line with these, the following goals were identified for the energy sector:

- supply security and reliability
- energy affordability and accessibility
- environmental quality
- consumer protection

The Philippine total energy requirements are foreseen to grow at an annual rate of 6%. New and renewable energy sources, mostly traditional fuels such as fuelwood, agriwastes, bagasse and charcoal, already account for a major share of the indigenous energy.

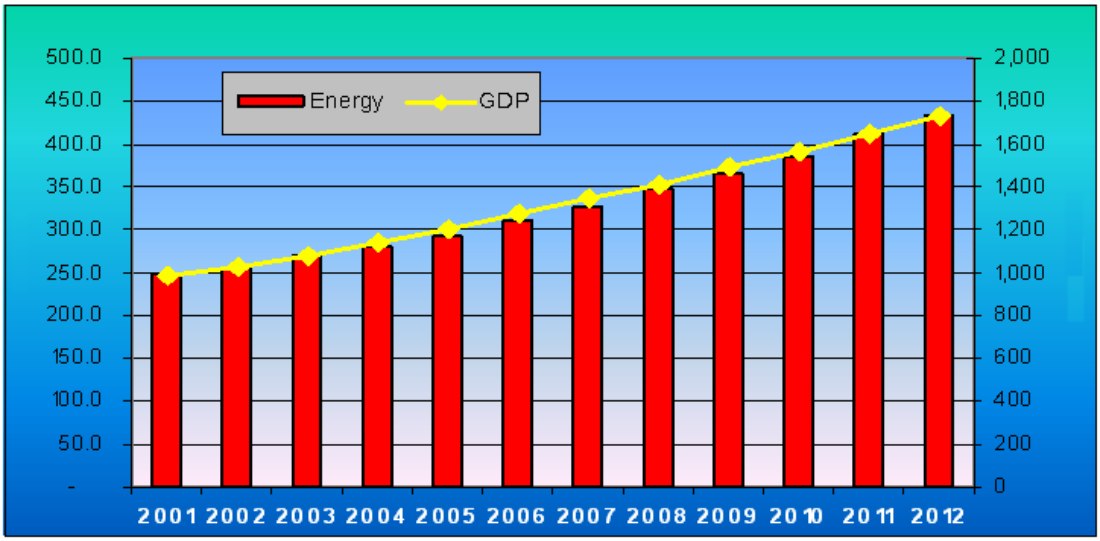
2.1 Energy Statistics and Data

Table 2.1: GDP vs. Total Energy

Years	GDP	Energy Growth (%)							
		Total	Oil	Gas	Coal	Hydro	Geo	Other RE	Others*
2003 – 2007	5.6	5.0	5.7	7.9	7.6	5.9	1.7	2.8	30.0
2008 – 2012	5.2	5.8	5.6	1.2	0.4	0.1	0.0	2.7	62.3
2003 – 2012	5.4	5.5	5.8	5.0	4.0	2.7	0.7	2.8	65.3

Source: Philippine Energy Plan 2003-2012
* Beginning 2005 only, 'Others' refer to energy inputs for power generation to be supplied by yet undetermined fuel sources

Figure 2.1: GDP vs. Total Energy



Source: Philippine Energy Plan 2003-2012

Table 2.2: Total Primary Energy Mix (in MMBFOE)

	2001*	2003**	2007**	2012**
Imported Energy (MMBFOE)	**135.4**	**124.9**	**157.6**	**194.4**
Imported Oil (%)	45.3	37.7	38.6	39.6
Imported Coal (%)	9.2	8.9	9.7	5.3
Others (%)	-	-	0.7	10.7
Indigenous Energy (MMBFOE)	**113.0**	**143.3**	**166.7**	**192.4**
Other RE (%)	31.0	30.4	27.9	24
Geothermal (%)	7.2	8.7	7.7	5.8
Hydro (%)	4.9	3.9	4.1	3.1
Local Coal (%)	1.5	1.7	2.4	4.0
Gas (%)	0.6	6.3	7.0	6.0
Local Oil (%)	0.1	2.4	2.4	1.4
Self-sufficiency (%)	**45.5**	**53.4**	**51.0**	**44.4**
Forex savings (million USD)	**2,653**	**3,583**	**4,168**	**4,810**

Source: Philippine Energy Plan 2003-2012
* Actual ** Base Case

Table 2.3: Indigenous Energy Supply (in MMBFOE)

	Natural Gas	Oil	Geothermal	Other RE	Coal	Hydro	Total
Actual 2001	1.46	0.32	18.0	77.13	3.84	12.25	113.00
2002	11.92	2.19	21.41	79.02	4.43	10.35	129.32
2003	16.86	6.35	23.53	81.50	4.50	10.57	143.31
2004	19.39	17.60	24.96	84.31	5.13	11.52	162.91
2005	20.65	15.96	25.09	86.70	5.62	13.24	167.26
2006	21.67	13.09	25.15	89.03	6.26	13.27	168.47
2007	22.84	7.91	25.16	91.14	6.30	13.31	166.66
Average							
2003 – 2007	20.28	12.18	24.97	92.85	8.92	12.91	
2008 – 2012	21.90	6.88	24.78	86.54	5.56	12.38	
Growth Rate							
2003 – 2007	7.88	5.65	1.69	2.83	8.78	5.93	
2003 – 2012	5.02	(0.54)	0.75	2.75	16.29	2.71	

Source: Philippine Energy Plan 2003-2012

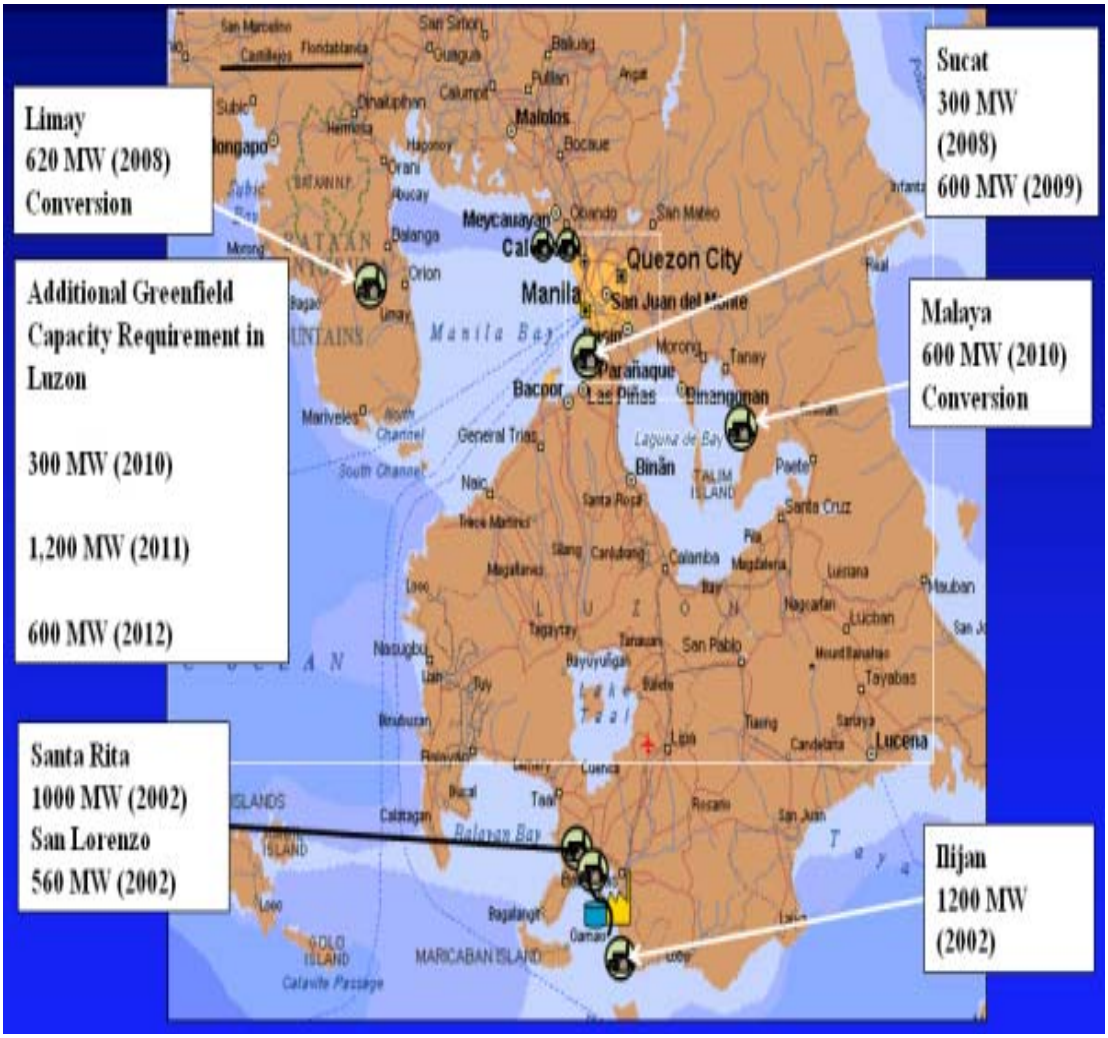
Table 2.4: The Philippine Energy Mix (in %)

	2001	2007	2012
Oil	45.3	38.6	39.6
Coal	9.2	9.7	5.3
Indigenous	45.5	51	44.4
Gas	0.6	7.0	6.0
Other RE	31	27.9	24
Local Coal	1.5	1.9	4
Hydro	4.9	4.1	3.1
Geothermal	7.2	7.7	5.8
Local Oil	0.1	2.4	1.4
Others (unidentified)		0.7	10.7

Source: THE PHILIPPINE NATURAL GAS INDUSTRY: Vision, Strategy and Policy, A Briefing for the Proponents of House Bill No. 4754, Presented on February 5, 2003 in Quezon City, Philippines by the Philippine Department of Energy.

According to the Briefing for the Proponents of House Bill No. 4754, Presented on February 5, 2003 in Quezon City, Philippines by the Philippine Department of Energy titled, PHILIPPINE NATURAL GAS INDUSTRY: Vision, Strategy and Policy, A, the total natural gas available has been estimated to be 28531 BCF with discovered resources to be 3,841 BFC and the remaining undiscovered resources to be 24690 BCF.

Figure 2.2: Potential Gas-Fired Power Plants



Source: THE PHILIPPINE NATURAL GAS INDUSTRY: Vision, Strategy and Policy, A Briefing for the Proponents of House Bill No. 4754, Presented on February 5, 2003 in Quezon City, Philippines by the Philippine Department of Energy.

2.2 Electricity Supply Industry

2.2.1 Current electricity situation:

Demand for electricity is expected to grow with new installed electric capacity. About half of these capacity additions are already on-going and committed projects of NPC and MERALCO while the other half uncommitted capacities are expected to be filled in by Independent Power Producers (IPPs) in the deregulated market environment. While the combined capacity from existing and committed plants is more than enough to sustain the growth in power demand up to the year 2007,

the capacity gap during the period 2007-2010 represents the uncommitted capacity that will be put up by the private sector under the restructured power market. Major developments are expected in the electric industry with the recent signing of the implementing rules and regulation for Republic Act (RA) 9136 also known as the "Electric Power Industry Reform Act of 2001 (EPIRA)." With the "Accelerated Barangay Electrification Program" (rural electrification) of the government in place, the less complicated site selection of cogeneration facilities for power generation projects may have a greater advantage compared to large-scale transmission dependent utility scale projects.

Figure 2.3: Philippine Power Sector Situation.

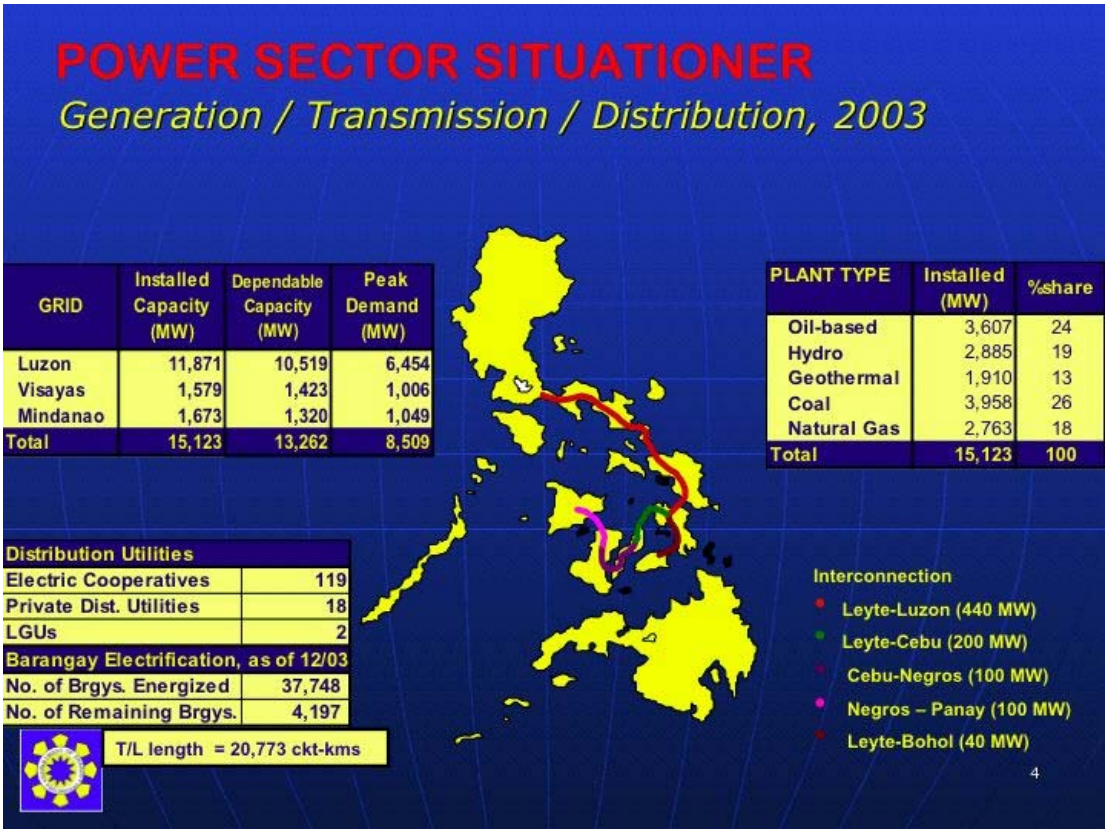


Table 2.5: Load consumption and grid generation

Items	Year									
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Electric Consumption (GWh)	29,240	32,289	34,138	34,142	36,555	39,140	47,792	51,182	55,154	59,548
National Grid Generation (GWh)	36,707	39,797	41,578	41,432	45,290	47,049	51,559	56,051	60,483	64,779
Peak Load (MW)[1]	5,816	6,352	6,666	6,908	7,400	7,682	8,390	9,131	9,983	10,951
Supply (MW)[2]	7,578	7,861	7,389	8,177	9,733	9,937	12,391	12,391	12,355	12,135

Source: Power Statistics, DOE and Philippine Energy Plan 2002-2011
Note:
1. Average load demand (MW)
2. Average supply (MW), dependable capacity

Load consumption and grid generation

Peak demand for each of the Luzon, Visayas and Mindanao grids differ from each other because of the varying levels and cycles in these grids respective economic activities. For 2003, peak demand

for Luzon, Visayas and Mindanao registered at 6,454 MW; 1,006 MW and 1,049 MW respectively or a total of 8,509 MW.

Under the 2004 to 2013 PEP the combined or non-coincident peak demand of the Philippines is expected to increase from 9,134 MW in 2004 to 12,204 MW in 2008 and 17,241 MW in 2013 translating to an average annual growth rate of 7.3 percent during the next ten years.

Based on the projected peak demand, an optimal capacity expansion plan was determined. Using the key assumptions applied to NEDA's low GDP projections, a total of 7,015 MW is needed to be commissioned within the planning period. Of these, 765 MW is currently considered as committed projects (i.e. those that are under construction; have been contracted to private entities for development; or have closed financing negotiations). This is broken down into 415 MW in Luzon, 150 MW in the Visayas and 200 MW in Mindanao.

The resulting electricity demand projections anticipate power supply shortages by 2008 in both Luzon and Visayas grids and 2005 for the Mindanao Grid if no adequate capacity addition is put in place.

Projected electricity generation by type of fuel

The country's power generation mix will grow by an average annual rate of 7.6 percent during the next ten years to support the expected electricity demand growth pegged at 7.3 percent. From 57.2 TWH in 2004, gross generation is expected to reach 79.1 TWH in 2008 and 111.2 TWH in 2013.

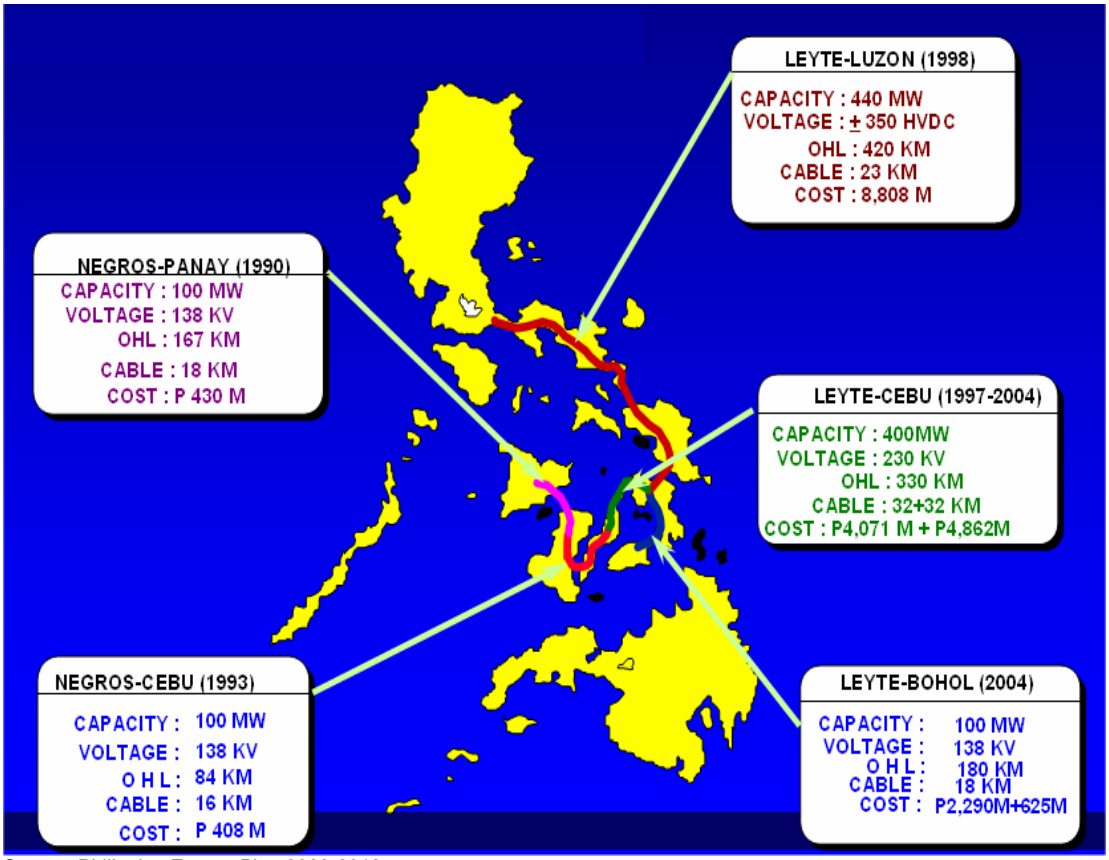
The power generation mix will experience a constant growth pattern between 2004 and 2008 with the commercial operation of the 765 MW committed capacity.

Table 2.6: Generating Capacity Additions in the Philippines (in MW, Base Case)

Year	Indicative			
	Committed	Baseload	Intermediate	Peaking
2004	455			
2005	345		300	
2006	200		50	
2007		150		
2008		250	300	
2009		150	700	300
2010		800	300	450
2011		1,150	300	
2012		800		150
Total	**1,000**	**3,300**	**1,950**	**900**

Source: Philippine Energy Plan 2003-2012

Figure 2.4: Power Transmission Development - Interconnection Projects



Source: Philippine Energy Plan 2003-2012

Voltage Levels and Length of Transmission and Distribution Lines of National Grid in 2003

As of end-2002, the National Transmission Company (TRANSCO) administered about 20,731.2 circuit kilometers of transmission and sub-transmission lines and 23,629.3 megavolt-amperes (MVA) of substation capacity. A total of 10.9 ckt-kms of transmission lines and 2,180.2 MVA of substation capacity were installed in the main grid in 2002.

Table 2.7: Voltage Levels and Length of Transmission and Distribution Lines of National Grid in 2001

Voltage level	Total (km)
500 KV	1,052.94
350 KV	922.94
230 KV	5,205.84
138 KV	4,359.01
115 KV	300.81
69 KV	2,346.50
Below 69 KV	5,899.09
Total	**20,087.13**

Source: Philippine Energy Plan 2002-2011/
Note: No breakdown is available

Table 2.8: National Grid Generation & Grid Line Losses by Agencies

Agencies	1995		1996		1997		1998		1999		2000		2001	
	Gen.	Loss.	Gen.	Loss.	Gen.	Loss.	Gen.	Loss.	Gen.	Loss.	Gen.	Loss.	Gen.	Loss.
NPC	22,138		23,816		38,702		39,684		39,257		40,978		42,302	
Meralco	0		0		916		857		832		3,213		3,712	
NEA RECs	73		93		97		242		123		73		67	
Private Utilities	53		60		82		795		1,220		1,026		967	
IPPs	11,291		12,739		*		*		*		*		*	
Total	33,554	5,735	36,708	6,128	39,797	6,037	41,578	5,849	41,432	5,754	45,290	6,345	47,049	5,713
% Losses		17.1		16.7		15.2		14.1		13.9		14.0		12.1

Source : Power Statistics, DOE
Note : Gen. = Generation, Loss. = Losses
1. No breakdown of power losses per company is available
* Generation is already included in the utilities

2.2.2 The Structure:

The Philippine electric power industry is heavily dominated by the State-owned National Power Corporation. Lack of competition in the industry hampered private investment in the Philippines and opportunities for attracting foreign capital were limited. Ownership of generation and transmission facilities by a single entity restricted transparency in electricity pricing and led to high debt in the sector.

The National Power Corporation (NPC) transmits electricity to distributors and large industrial customers through high voltage transmission wires. NPC is also responsible for constructing the transmission grid highway interconnecting the main islands nationwide. A number of Independent Power Producers generate and sell electricity to NPC and other customers. There are at least thirty-five NPC-contracted IPPs operating throughout the archipelago with a total combined installed capacity of over 5,000 MW.

Distribution of electricity at its usable voltage to end-consumers is performed by investor-owned electric utilities like the Manila Electric Company, a few local government-owned utilities and about 119 electric cooperatives. These utilities sell to households as well as to commercial and industrial enterprises located within their franchise areas with tariffs regulated by the Energy Regulatory Board (now Energy Regulatory Commission).

Following the adoption of RA 9136, the sector will be split into four segments: generation, transmission, distribution and supply and NPC's generation assets will be divested into a number of separate businesses. A wholesale electricity spot market will be created facilitating competition between individual generating companies. TRANSCO is obliged by EPIRA to provide open access to the grid.

2.3 Power Sector Priorities

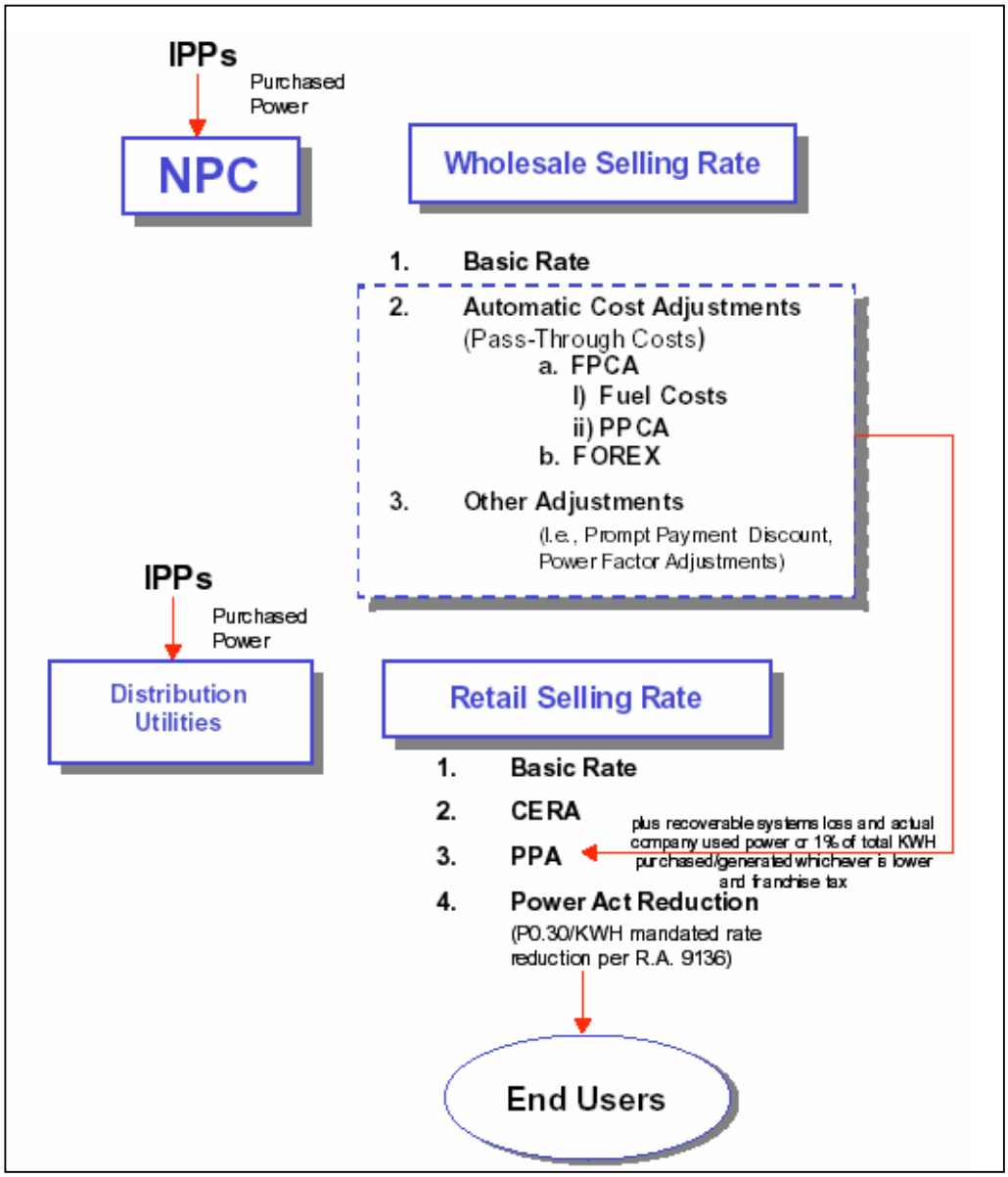
Objectives of the Philippines Power Sector Strategy

Energy Sector Goals	Strategies
Stable and secure energy supply	Increase energy self-sufficiency level
	Intensify the development, exploration and use of indigenous energy
	Diversify energy sources/fuels
Wider access to energy supply	Accelerate rural electrification in coordination with other agencies
Fair & reasonable energy prices	Implement the provisions of EPIRA
	Monitor and review sector pricing policies to ensure transparency
	Improve system efficiency
Clean & Efficient energy fuels & Infrastructure	Promote energy efficiency and conservation programs
	Promote the wide-scale use of NRE and other
	Clean fuels and technologies
	Ensure compliance with environmental standards
Enhanced Consumer welfare & Protection	Ensure effective oil industry self-regulation mechanisms
	Empower consumers through various programs such as information/tri-media campaigns, for a and trainings
Technology transfer & manpower development	Facilitate the adoption of state-of-the-art technology and development experts in energy-related matters
Job Creation from Energy Activities	Promote investments and livelihood activities in energy projects
	Encourage employment in facilities where electrification, construction of energy-related facilities and indigenous energy development are being undertaken
	Pursue joint ventures with other creatures.

2.4 Tax structure and Fuel Tariff / Prices

The Power Rates

Figure 2.5: Components of an existing electricity bill



Source: Frequently Asked Questions on Power Rate Adjustment, downloaded from http://www.erc.gov.ph/publication.asp

The components of a typical electricity bill presented to the consumer by a private distribution utility company (i.e.Meralco) include:

1. The Basic Charge – allows the utility firm to recover its operating expenses and attain a reasonable return on its investment. In the case of Meralco, it refers to a portion of the Purchased Power Cost equivalent to P 1.7845 per KWh which has not changed since 1994.

2. Currency Adjustment – covers the increases and decreases in the operation and maintenance expenses and foreign debt principal payments due to changes in the peso-dollar exchange rate. This is expressed as a percentage of Basic Charges.

3. Purchased Power Adjustment (PPA) – covers the increases and decreases in the cost of power bought from the National Power Corporation (NPC) and other power suppliers such as the IPPs. For Meralco, it represents changes in the utility's Purchased Power Cost beyond the base level of P1.7845 per KWh. Included in the PPA are (1) recoverable systems loss, (2) actual company used power or 1% of total Kwh purchased/generated, whichever is lower, and (3) 2% franchise tax.

4. Power Act Reduction – refers to the mandated rate reduction of P 0.30 per KWh pursuant to Section 72 of Republic Act No. 9136. For instance, a consumption of 100 KWh will reduce the consumer's electric bill by P 30.00.

5. The Energy Regulatory Commission (ERC) approved the request of the still state-owned National Power Corporation (NAPOCOR) for a provisional authority to implement a Special Program to Enhance Electricity Demand (SPEED) program. The SPEED provides a fixed discount of 80-centavos per kilowatthour for industrial users in Luzon Grid directly connected to NAPOCOR for the incremental use of power above the customers' base line.

6. The ERC has also determined the universal levy for SPUG amounting to 0.0168 P/kWh for 2003.

The Government's 10-point Agenda for the Reduction of Electricity Rates can be found in Annex 5.

The latest development in the power tariff structure as of May 15, 2003 is the change in the charge of the generation rates at: 2.12 P/kWh in Luzon, 2.24 P/kWh in the Visayas and 1.02 P/kWh in Mindanao.

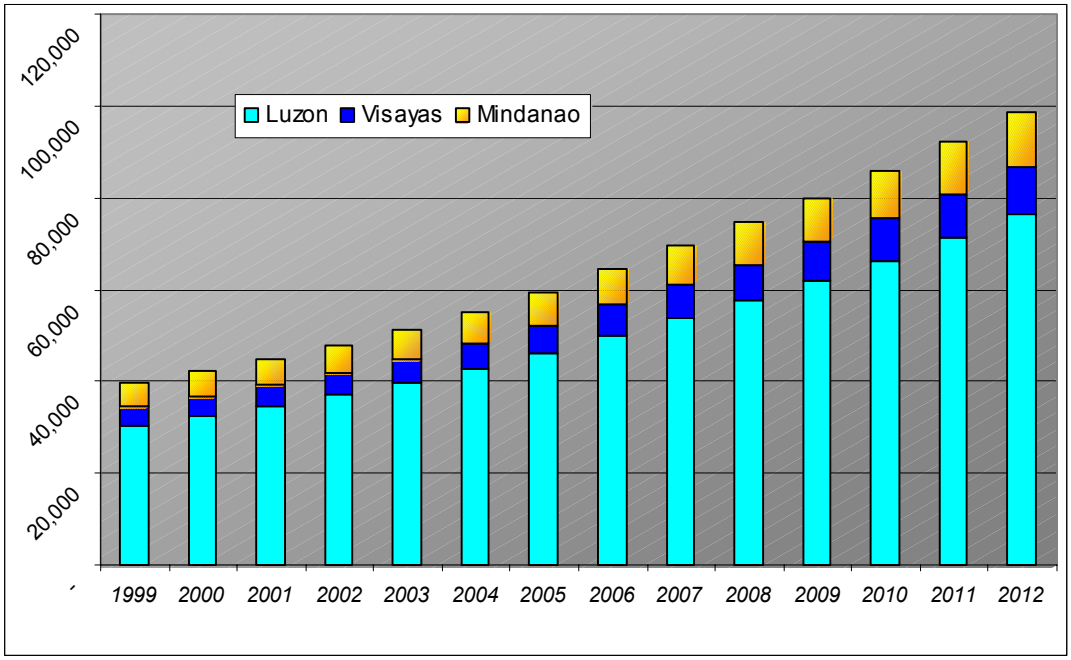
2.5 The Energy Forecast

The 2004-2013 Philippine Energy Plan (PEP) affirms the energy sector's continuing commitment to the macroeconomic goals of the present Administration to promote balanced economic growth, alleviate poverty and foster a market-based industry.

The 2004 Plan update adopts the low economic growth projections of the National Economic and Development Authority (NEDA). The indicative Gross Domestic Product (GDP) growth rates range from 4.2 to 5.8 percent in the period 2003 to 2006 and 5.3 to 6 percent from 2007 to 2013.

The PEP adopts the average population growth rates of 1.7 percent, the same growth rate used in the 2003 to 2012 Energy Plan.

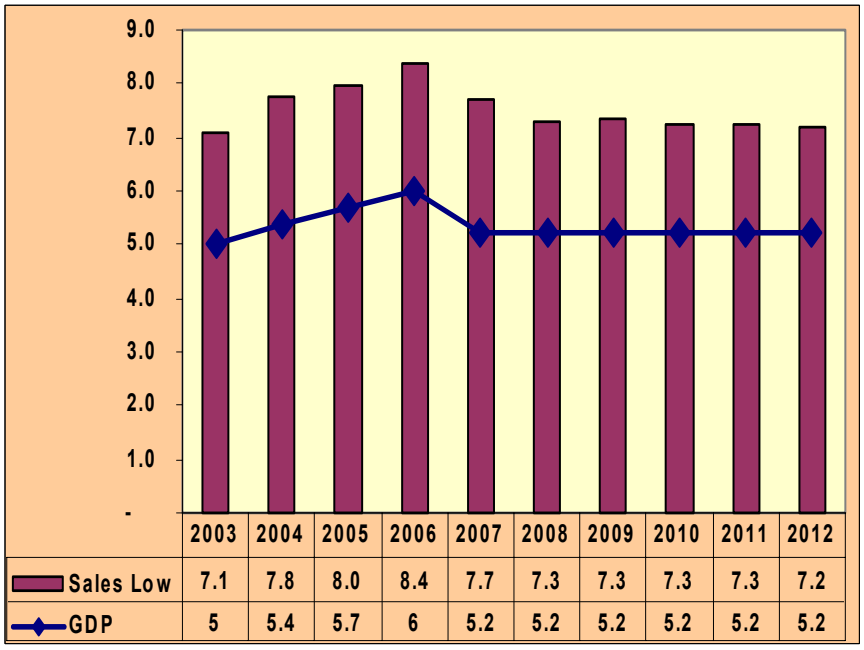
Figure 2.6: Electricity Sales Forecast (in GWh, Base Case)



Source: Philippine Energy Plan 2003-2012

The chart below shows the Gross Domestic Product versus electricity sales forecast in Percent. The planning horizon extends up to 2012 and assumes a 5.2 percent growth from 2007 up to 2012.

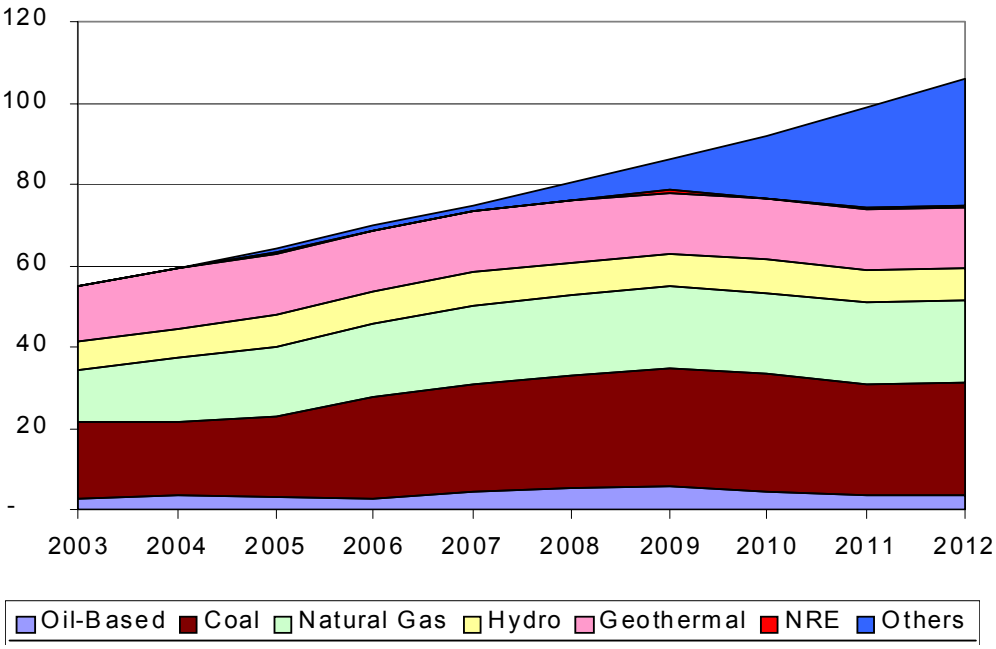
Figure 2.7: GDP vs. Electricity



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Sales Low	7.1	7.8	8.0	8.4	7.7	7.3	7.3	7.3	7.3	7.2
GDP	5	5.4	5.7	6	5.2	5.2	5.2	5.2	5.2	5.2

Source: Philippine Energy Plan 2003-2012

Figure 2.8: Details of Power Generation Forecast (in TWh) up to 2012



Source: DOE

2.6 Key Players in the Cogeneration Market

There are an estimated 300 operational biogas units of varying capacity, both industrial and household scale, in the Philippines. Biogas is used for process heat, power generation and lighting. An example of pig wastes utilisation is the system of Maya Farms, a large hog farm and meat processing plant, which pioneered the use of biogas technologies for large-scale applications. Until recently, the farm met all of its power needs from its biogas plant, based on Indian, Chinese and European technologies. The latest cogeneration installations are

3. the 50MW Victorias Cogeneration Project, Negros Occidental of the Victorias Bioenergy Inc. and
4. the 30 MW First Farmers Cogeneration Project in Talisay City, Negros Occidental of the Talisay Bioenergy, Inc.

The policy makers of the Department of Energy have widely expressed their inability to get enough information on cogeneration let alone formulate policies in this regard. The potential industries with cogeneration possibilities also lack information on the benefits of cogeneration and the possibility of efficient usage of waste generated as in the case of sugar mills and rice mills.

An installed cogeneration capacity of 345 MW, in 1995 was established in 11 industrial sectors consisting of 63 such facilities and sugar industry accounted for about 57% of them. It is also a fact in Philippines that there are no cogeneration facility available as yet in any of the sugar mills and the rice husk produced is left to waste without being used for any specific purpose.

The Philippines has 39 sugar mills, located mostly in Negros and each having an average daily capacity of 4,600 tons of sugarcane. A study by the Philippine Sugar Millers Association showed that improvements in existing cogeneration systems -- having an average thermal efficiency of only 62.5 % -- can bring about 100 MW of exported power to the grid. In the Philippines, the Paper Industries Corporation operates a total utilisation policy: forest and saw mill wastes are burned with black liquor for cogeneration of process heat and electricity.

3. Energy Sector Legislation Framework

The Energy Sector

Policy making in general, resides with the Philippine Congress. For the energy sector, Congress has assigned specific energy policy functions to the Department of Energy. This includes the execution of the electric power industry reform, the privatisation of the National Power Corporation, and the rationalisation of rural electrification development.

The Department of Energy sets the policy directions for the energy industry while the National Electrification Administration provides financial and technical assistance to electric cooperatives. The National Power Corporation and the National Electrification Administration are attached agencies of the Department of Energy.

The Energy Regulatory Commission (ERC) is tasked with regulatory functions relevant to setting tariffs and ensuring consumer protection. An important function of the ERC is the issuance of operating permits of power generation facilities including cogeneration units.

The Department of Energy is the central planning and policy-making body in the energy sector. It is headed by a Secretary, who is a member of the Cabinet with the following government agencies attached to it: National Power Corporation, National Electrification Administration and the Philippine National Oil Company.

The Department of Energy was created to prepare, integrate, coordinate, supervise and control all plans, programs, projects and activities of the Government relative to energy exploration, development, utilisation, distribution and conservation.

Table 3.1: Policy Making Institutions Responsible For Energy Related Activities In Philippines:

THE ENERGY SECTOR			
The Policy Maker		**The economic and technical regulatory functions related activities.**	
Institution	***Area of Jurisdiction***	***Institution***	***Area of Jurisdiction***
Department of Energy	Central planning and policy making body of the power industry	**National Economic and Development Authority**	Country's independent economic development and planning agency
		Energy Regulatory Commission	Sole regulatory agency for the power industry
THE ENVIRONMENT SECTOR			
The Policy Maker			
Institution		***Area of Jurisdiction***	
Department of Environment and Natural Resources		Primary government agency responsible for the conservation, management, development and proper use of the country's environment and natural resources, including those in reservations, watershed areas and lands of the public domain, as well as the licensing and regulation of all natural resources utilisation as may be provided by law in order to ensure equitable sharing of the benefits derived therefrom for the welfare of the present and future generation of Filipinos.	
THE INDUSTRY SECTOR			
The Policy Maker			
Institution		***Area of Jurisdiction***	
Department of Trade and Industry (DTI) Department of Energy		Provides the primary staff function to support industrial policies and programs in the Philippines	

The Environment Sector

Policy making in general resides with the Philippine Congress. The recent promulgation of the Republic Act No. 8749, otherwise known as the "Philippine Clean Air Act of 1999," provides certain environmental policy mandates to the Department of Environment and Natural Resources (DENR). The implementing rules and regulations for RA 8749, including pollution standards, are attached.

The DENR is mandated to be the primary government agency responsible for the conservation, management, development and proper use of the country's environment and natural resources, including those in reservations, watershed areas and lands of the public domain, as well as the licensing and regulation of all natural resources utilisation as may be provided by law in order to ensure equitable sharing of the benefits derived there from for the welfare of the present and future generations of Filipinos.

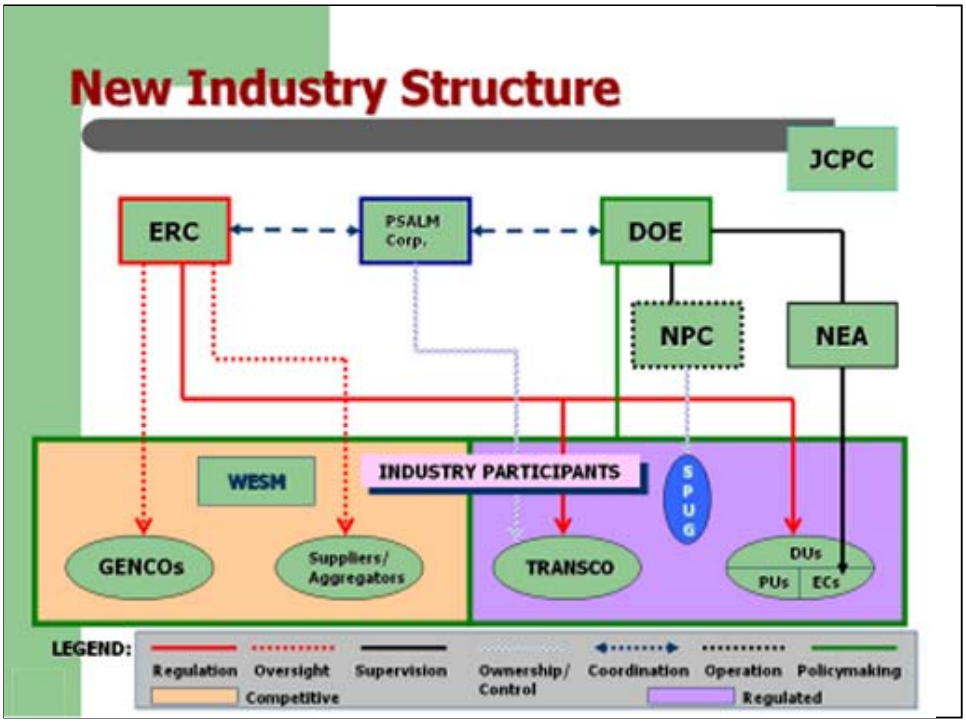
The Environmental Management Bureau is line bureau under the DENR. The EMB is the primary government agency to formulate, integrate, coordinate, supervise and implement all policies, plans, programs, projects and activities relative to the prevention and control of pollution as well as the management and enhancement of environment.

The Industry Sector

The Department of Trade and Industry (DTI) provides the primary staff function to support industrial policies and programs in the Philippines. The Board of Investments (BOI) is an attached agency of the DTI tasked with promoting investments in industry and commerce. The BOI administers the investment incentives given to the priority industries defined under the investment priorities plan.

3.1. Liberalisation of the Electricity and Gas Market

Figure 3.1: New Philippine Electricity Structure



Source: *Power Sector Restructuring: The Philippine Model,* Presentation by Undersecretary J. V. Emmanuel de Dios, PHILIPPINE DEPARTMENT OF ENERGY, http://www.doe.gov.ph/power

On June 26, 2001, the Philippine Government enacted the Electric Power Industry Reform Act of 2001 (EPIRA). Two major reforms are embodied in the Law namely: the restructuring of the electricity supply industry and the privatisation of the National Power Corporation.

The restructuring of the electricity industry calls for the separation of the different components of the power sector such as generation, transmission, distribution and supply. The main objective is to enhance the efficiency of the power industry and to ensure the financial viability of the industry independent from the Government. As legislated, the new power industry is characterised by competing generation companies where electricity tariffs are market driven. This means that the generation sector will be open to competition and participated in by entities such as generation companies, independent power producers, distribution utilities owning and operating generation plants, cogeneration facilities and self-generators. Ultimately, the consumer will have the power of choice. Competition among suppliers will enable customers to buy affordable and reliable power from electricity generators in the market.

The transmission business is continually recognised as a monopoly and therefore would be regulated. The ownership and operation of the transmission system will be transferred to the newly created National Transmission Company (TRANSCO), which shall initially be Government but eventually privatised.

Distribution shall remain to be regulated by the newly formed Energy Regulatory Commission.

The privatisation of the state-owned National Power Corporation involves the sale of the firm's generation and transmission assets to private investors. NPC's generation facilities shall be grouped into clusters and offered for sale to strategic investors. The transmission facilities shall likewise be privatised either through outright sale or through concession contract with a strategic partner with proven experience and expertise in the operation of a transmission system of similar or bigger magnitude than that of the Philippines.

These two reforms are aimed at encouraging greater competition and attracting more private-sector investments in the power industry. It is believed that greater competition will result in lower power rates and more efficient delivery of electricity supply to end-users.

Transmission Sector

The TRANSCO franchise bill, a measure critical to ensure the privatisation of the Transmission Company, secured the approval of the Lower House just before the closing of session for the Christmas holidays in 2002.

GENCOs Privatisation

It is targeted for completion in 2004. The mode of privatisation whether sequential or simultaneous sale is still to be determined.

PSALM has commenced the preparatory work for the sale process of the following power plants: Calaca, Masinloc, Angat, Magat, the Individual Geothermal Plants (Bacman, Palinpinon, Tiwi-Makban and Tongonan) and other Individual Plants and Major sites (Sucat, Loboc, Amlan, Talomo, Agusan, Navotas 1 to 3, Navotas 4, Bohol, Panay I, Diesel Barges, Iligan, Pinamucan and Tegen site). Preliminary Information Memorandum has been on sale since August 2003 for interested bidders. By October 2003, the proposed GENCO groupings as well as the sale sequencing shall be finalised. The fourth quarter of 2003 is targeted to be the beginning of the bidding and awarding of the power plants.

Wholesale Electricity Spot Market (WESM)

The Wholesale Electricity Spot Market (WESM) Rules establishes the basic rules, requirements and procedures that govern the operation of the Philippine electricity market. The WESM Rules identifies, recognises and sets the responsibilities of the Market Operator, System Operator, WESM Participants, and the PEM Board. These groups shall comply with and are bound by all the provisions of the WESM Rules. The WESM Rules are intended to be complimentary with the Grid Code and Distribution Code, all of which are meant to ensure the development of an appropriate, equitable and transparent electricity market, along with safe, reliable, and efficient operation of the power system.

3.2. Legislation and Programs Promoting Cogeneration

The energy sector objectives embodied in the 2004 to 2013 Philippine Energy Plan, while similar to the previous year's statement of objectives, have been reformulated to provide greater impetus towards the achievement of the national macroeconomic objectives namely economic growth, poverty alleviation and a market-based industry. Specifically, the energy sector objectives which will have a bearing on the cogeneration would be:

To pursue cleaner and efficient energy utilisation and clean energy technology applications

3.3. Legislation and Programs Promoting Energy Efficiency, Biomass and Renewable Energy (RE)

The current administration is committed to pursue the continuous development and use of New and Renewable sources of energy as one of the major strategies to attain self-sufficiency along with environmental protection.

The country's NRE program aims to support the major thrust of the energy sector of attaining total electrification of remote Barangays in the country by 2004. Accordingly, the following strategies have been identified to attain said policy:

1. Intensify application of NRE systems in grid and off-grid areas
2. Institutionalise area-based energy planning and management to support rural electrification
3. Encourage favorable market environment for manufacturers in the NRE sector
4. Promote the interconnection of NRE facilities in island grids
5. Intensify the promotion of NRE systems
6. Continue adaptive research and development for more advanced technologies
7. Encourage the use of alternative liquid fuels for all government vehicles

New and Renewable Energy

A. Challenges and Gaps
   - Creation of investor-oriented environment
     - A credible environment which addresses legal and regulatory issues, reforms and incentives shall attract investments
     - Provision of sectoral reforms and rational incentives to build a friendly environment for NRE development
   - Maximise NRE as an alternative resource
     - NRE in the Philippines remains to be an underutilised resource with tremendous potential
   - Technology transfer
     - Any promotion of NRE would need adequate information and training programs

B. Programs and Projects
   - Promote large-scale commercialisation of NRE
     - Encourage the development and commercialisation of NRE technologies

  - Optimise the use of NRE as an alternative energy resource
- Improve regulatory and investment environment
  - Pursue the passage of NRE law that provides regulatory framework and relevant incentive schemes to NRE developers/investors

The Secretary of Energy has issued the following policies being seriously considered to promote renewable energy development:

- Priority dispatch of small renewable energy under the Wholesale Electricity Spot Market (WESM) Rules
- Allocate a minimum amount of generation capacity from renewable energy
- Promotion of Green Renewable IPPs (GRIPPs)
- Introduce Green Pricing Program mechanism to promote consumer choice of power supply

The Department of Energy has announced the ASEAN Energy Awards 2003 for New and Renewable Energy Projects.

Energy Efficiency (Philippine Energy Plan 2003 – 2012, DOE Presentation)

A. Challenges and Gaps

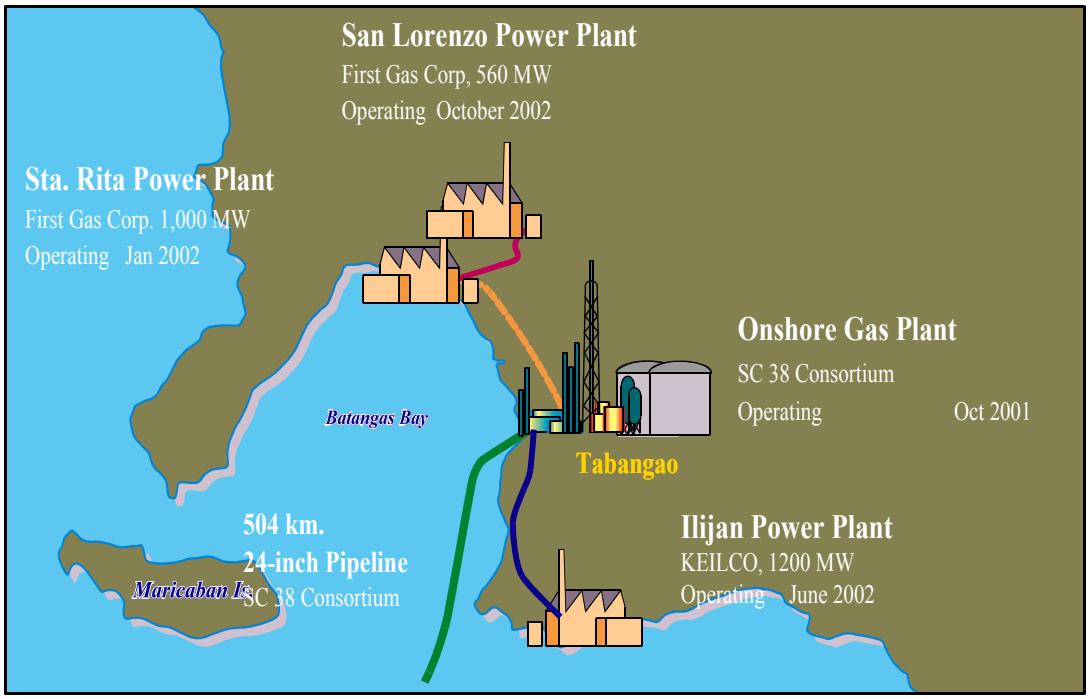
- ❖ Market transformation
  - There is a need for a market transformation, with the DOE's overall energy efficiency programs serving as catalyst, where market players and consumers place a higher premium on energy efficiency strategies, technologies, products and services.
- ❖ Consumer awareness and protection
  - There is a need to uplift consumer awareness on the patented pecuniary and environmental gains through energy efficiency and protect them from rising cost of energy.

B. Programs and Projects

- ❖ Creation of a market that is more responsive and receptive to energy efficiency needs and technology trends
  - Integrate energy efficiency into market in the form of strategies, approaches and viable measures that will result in actual savings
- ❖ Empowerment of consumers to better access tools to sustainable growth via energy efficiency
  - Conduct education and information dissemination activities on energy efficiency strategies, technologies, products and services
  - Strengthen consumer protection by ensuring that energy products and services in the market comply with energy efficiency standards.

3.4. Legislation and Programs Promoting Natural Gas

Figure 3.2: Gas Pipelines and 2700-MW Gas Fired Power Plants



Source: THE PHILIPPINE NATURAL GAS INDUSTRY: Vision, Strategy and Policy, A Briefing for the Proponents of House Bill No. 4754, Presented on February 5, 2003 in Quezon City, Philippines by the Philippine Department of Energy.

Downstream Natural Gas

The DOE recently issued Interim Rules and Regulations Governing the Transmission, Distribution and Supply of Natural Gas to address gaps in existing laws and provide basic framework to guide initial investments and business operations in the downstream gas industry. The rules are designed to mitigate investment risk during the industry's development stage while laying the foundation for a competitive market in the future. As such, the rules will be reviewed periodically. The DOE is working closely with Congress on the passage of a proposed legislative measure to establish a more comprehensive and stable legal and institutional framework to govern the regulation of the natural gas industry.

The Department of Energy is working out additional package of incentives to be offered in line with amendments to PD 87 or the Oil and Gas Law, which include:

- cross cost recovery of exploration and development expenditures, and
- enhanced cost recovery and flexibility in reducing share for marginal fields and high-cost frontier areas.

Natural Gas Policy

- Promote natural gas as a secure, stable and economically efficient source of energy
- Promote competition by liberalising entry and adopting competition and fair trade measures with due regard to public welfare and the financial viability of industry participants
- Promote natural gas as an environmentally friendly source of energy
- Ensure compliance with international safety standards and Philippine environmental laws, rules and regulations

Natural Gas Objectives

- Increased share of natural gas in the energy and power mix while maintaining a diversified fuel mix
- Increased utilisation of natural gas as fuel in the power and non-power sectors
- Competitive natural gas prices vis-à-vis other fuels in a regulated market which transforms into a deregulated market characterised by gas-to-gas competition and market based transactions
- Adoption of state of the art technology, development of experts in energy matters, increased employment and manpower development in localities where the development of indigenous natural gas is undertaken
- Increased economic benefits to consumers

Recent development in policy and regulatory framework on natural gas
- DOE Charter
- E.O. No. 66
- DOE Gas Circular – Interim Rules and Regulations
- Philippine Energy Plan 2003-2012

Key provisions of the Interim DOE Gas Circular
- Industry Structure
  - Downstream Natural Gas Industry: Transmission (T), Distribution (D) and Supply (S)
  - Vertical integration allowed
- Entry Regulation
  - Franchise and other legislative authorisations required to operate T& D as public utility
  - Permits required for T, D and S
  - Own-use permit allowed for end-user facilities
- Access Liberalisation
  - Third Party Access to T, D and related facilities required
  - Deferment allowed on new facilities
  - Access conditions negotiated
- Price regulation
  - Prices of T, D, and S deregulated for competitive markets.
  - ERC to regulate prices charged by distribution utilities
  - Promotion of Competition
  - DOE to enforce measures to restore competition

3.5. Legislation and Programs Promoting Coal

The Philippine Energy Plan envisions developing a stable and secure energy supply mix by means of the following strategies:
- Increase energy self-sufficiency level
- Intensify the development, exploration and use of indigenous energy
- Diversify energy sources/fuels

These strategies point to a positive support for indigenous coal and gas resources.

Coal

A. Challenges and Gaps
- Availability/Development of ready market
  - Coal end-users opt for imported coal because local coal does not consistently match quality and specification requirements
- Improvement in mining technology
  - The low production output of coal producers is due to difficult mining conditions which have contributed to unstable supply
- Socio-Political Issues

- The peace and order problem in some areas has forced contractors to cease operations and delay coal exploration activities
- The misimpression of some local residents about coal mining's effect on the environment delays the issuance of pertinent documents necessary for the commencement of operations

B. Programs and Projects

- Encourage investments in mine-mouth coal power plants
  - A study will be undertaken to determine the feasibility in putting up a mine-mouth coal-fired power plants using clean coal technology in particular locations where the coal reserves warrant.
- Determine and promote alternative uses of indigenous coal
  - Alternative uses for local coal shall be pursued such as coal briquettes, horticulture and industrial paints.
- Intensification of small-scale coal mining program
  - Enhance the delineation of potential small-scale coal mining areas which could be offered to rural communities to generate more employment opportunities.
- Development of market for local coal
  - Conduct pre-feasibility studies on establishment of mine-mouth power plants using clean coal technology
- Improvement in mining technology
  - Determine applicability of appropriate mining methods to increase mine productivity

3.6. Clean Development Mechanism

The Philippine Senate has approved on third reading on October 24, 2003 a resolution concurring in the ratification of the Kyoto Protocol to the United Nations Framework Convention on Climate Change. With such concurrence, the Philippines can now participate in the Clean Development Mechanism (CDM) in the reduction of gas emission to five percent of 1990 levels during the period of 2008 to 2012. Secretary Vincent Perez announced this important event during his presentation at the Sustainable Energy, Energy Efficiency and Environmental Solutions Expos 2003.

4. Conclusions

5. Links and Other Sources of Information

1. THE PHILIPPINE NATURAL GAS INDUSTRY: Vision, Strategy and Policy, A Briefing for the Proponents of House Bill No. 4754, Presented on February 5, 2003 in Quezon City, Philippines by the Philippine Department of Energy.

2. Asian Development Bank and World Bank Yearly Report for Year 2002

3. BP Amoco Statistical Review

4. Power Statistics (DOE)

5. Philippine Energy Plan 2002-2011

6. Power Sector Restructuring: The Philippine Model, Presentation by Undersecretary J. V. Emmanuel de Dios, PHILIPPINE DEPARTMENT OF ENERGY, http://www.doe.gov.ph/power

7. Philippine Energy Plan 2003-2012

8. Department of Energy, www.doe.gov.ph

9. National Power Corporation, www.napocor.com.ph

10. Philippine National Oil Company, www.pnoc.com.ph/index2.htm

11. National Electrification Administration, www.nea.gov.ph/home.htm

12. Energy Regulatory Commission, www.erc.gov.ph

13. CIA factbook, http://www.cia.gov/cia/publications/factbook/

ANNEXES

Annex 1: General information

Official Name	Republic of the Philippines
Population	84,619,974 (July 2003)
Territory	300,000 km²
GDP (USD billions)	379.7 (2002)
GDP Growth	4.4% (2002)
GDP per capita (USD)	4,600 (2002)
Inflation	3.1% (2002)
Unemployment	10.2% (2002)
Currency	Philippine peso (PHP)
President	Gloria MACAPAGAL-ARROYO

Sources: CIA factbook, http://www.cia.gov/cia/publications/factbook/

Annex 2: National grid power plant & break down of installed capacity (MW)

Plant Name	Type of Power Plant	Type of Fuel	No. of Unit	Capacity (MW/unit)	Total Capacity (MW)
Pagbilao	Coal	Coal	2	382.00	764.00
Calaca	Steam	Coal	2	300.00	600.00
Masinloc	Coal	Coal	2	310.00	620.00
Sual	Coal	Coal	2	647.00	1,294.00
Quezon Power	Coal	Coal	1	480.00	480.00
Enron Subic	Diesel	Diesel	1	116.00	116.00
Edison Global (BEPZA)	Diesel	Diesel	1	64.00	64.00
Duracom	Diesel	Diesel	1	247.00	247.00
Pinamucan(Enron)	Diesel	Diesel	1	110.80	110.80
Angeles PI DPP	Diesel	Diesel	1	30.00	30.00
FPPC Bauang Dsl	Diesel	Diesel	1	235.20	235.20
Magellan Cogen (CEPZA)	Diesel	Diesel	1	63.00	63.00
FCVC DPP	Diesel	Diesel	1	32.00	32.00
Tarlac Electric	Diesel	Diesel	1	12.60	12.60
San Antonio	Combined Cycle	Natural Gas	1	3.00	3.00
Sta. Rita Natural Gas	Combined Cycle	Natural Gas	4	265.00	1,060.00
Ilijan	Combined Cycle	Natural Gas	4	300.00	1,200.00
San Lorenzo	Combined Cycle	Natural Gas	2	250.00	500.00
Hopewell GT	Gas Turbine	Fuel Oil	1	310.00	310.00
Limay CCGT	Gas Turbine	Fuel Oil	2	310.00	620.00
MakBan	Geothermal	Geothermal	6	55.00	330.00
MakBan B	Geothermal	Geothermal	4	20.00	80.00
Bac Man I	Geothermal	Geothermal	2	55.00	110.00
Bac Man II	Geothermal	Geothermal	2	20.00	40.00
Tiwi	Geothermal	Geothermal	6	55.00	330.00
MakBan Ormat	Geothermal	Geothermal	1	15.70	15.70
Manito	Geothermal	Geothermal	1	1.50	1.50
HEDCOR	Hydro	Hydro	1	22.00	22.00
Mini-Hydro	Hydro	Hydro	1	21.96	21.96
NIA-Baligatan	Hydro	Hydro	1	6.00	6.00
NMHC	Hydro	Hydro	1	6.00	6.00
Kalayaan	Hydro	Hydro	1	300.00	300.00
Magat	Hydro	Hydro	1	360.00	360.00
Masiway	Hydro	Hydro	1	12.00	12.00
Caliraya	Hydro	Hydro	1	32.00	32.00
Botocan	Hydro	Hydro	1	17.00	17.00
Angat	Hydro	Hydro	1	246.00	246.00
Pantabangan	Hydro	Hydro	1	100.00	100.00
Buhi-Barit	Hydro	Hydro	1	1.80	1.80
Ambuklao	Hydro	Hydro	1	75.00	75.00
Binga	Hydro	Hydro	1	100.00	100.00
Bakun	Hydro	Hydro	1	70.00	70.00
Casecnan	Hydro	Hydro	1	140.00	140.00

Malaya	Oil Thermal	Fuel Oil	2	350.00	700.00
ACMDC	Coal	Coal	1	100.00	100.00
Cebu TPP1 (Naga)	Coal	Coal	1	50.00	50.00
Cebu TPP2 (Naga)	Coal	Coal	1	55.00	55.00
Panay Power Corp.	Diesel	Diesel	1	74.88	74.88
PECO	Diesel	Diesel	1	19.85	19.85
ACMDC	Diesel	Diesel	1	45.05	45.05
Cebu Private Power	Diesel	Diesel	1	70.00	70.00
East Asia Utilities	Diesel	Diesel	1	49.70	49.70
PB 103	Diesel	Diesel	1	32.00	32.00
Panay DPP1	Diesel	Diesel	1	36.50	36.50
PB 104	Diesel	Diesel	1	32.00	32.00
PB 101	Diesel	Diesel	1	32.00	32.00
PB 102	Diesel	Diesel	1	32.00	32.00
Bohol DPP	Diesel	Diesel	1	22.00	22.00
Cebu DPP1	Diesel	Diesel	1	43.80	43.80
Negros GPP1 (Palinpinon)	Geothermal	Geothermal	1	112.50	112.50
Negros GPP	Geothermal	Geothermal	2	40.00	80.00
Tongonan GPP	Geothermal	Geothermal	1	112.50	112.50
Tongonan II & III (Leyte A)	Geothermal	Geothermal	1	610.80	610.80
Janopol	Hydro	Hydro	1	5.00	5.00
Mini-Hydro	Hydro	Hydro	1	4.61	4.61
Amlan HEP	Hydro	Hydro	1	0.80	0.80
Loboc HEP	Hydro	Hydro	1	1.20	1.20
Mindanao Energy Systems	Diesel	Diesel	1	18.90	18.90
Cotabato Light	Diesel	Diesel	1	10.00	10.00
Davao Light	Diesel	Diesel	1	58.69	58.69
Gen Santos	Diesel	Diesel	1	50.00	50.00
Power Barge 117	Diesel	Diesel	1	100.00	100.00
Mindanao PB Dsl II (Power Barge 118)	Diesel	Diesel	1	100.00	100.00
Western Mindanao Power Corp.	Diesel	Diesel	1	100.00	100.00
Mindanao I (Mt. Apo)	Geothermal	Geothermal	2	54.24	108.48
Mini-Hydro	Hydro	Hydro	1	13.00	13.00
Agus 1 Unit 1	Hydro	Hydro	2	40.00	80.00
Agus 2	Hydro	Hydro	1	180.00	180.00
Agus 4	Hydro	Hydro	1	158.10	158.10
Agus 5	Hydro	Hydro	1	55.00	55.00
Agus 6	Hydro	Hydro	1	200.00	200.00
Agus 7	Hydro	Hydro	1	54.00	54.00
Agusan	Hydro	Hydro	1	1.60	1.60
Pulangi 4	Hydro	Hydro	1	255.00	255.00
Northern Mindanao Power Corp.	Oil Thermal	Fuel Oil	1	108.60	108.60

Source: Power Statistics, DOE

Annex 3: Independent power producers

Power Plant Name	Owner	Type of Power Plant	Type of Fuel	Installed Capacity (MW)
Pagbilao Unit 1	Hopewell (Hongkong)	Coal	Coal	382.00
Pagbilao Unit 2	Hopewell (Hongkong)	Coal	Coal	382.00
Calaca 2	Far East Livingston (Singapore)	Steam	Coal	300.00
Calaca 1	Far East Livingston (Singapore)	Steam	Coal	300.00
Sual I & II	Hopewell (Hongkong)	Coal	Coal	1,294.00
Quezon Power	Meralco IPPs	Coal	Coal	480.00
Enron Subic	Enron Power Corp. (USA)	Diesel	Diesel	116.00
Edison Global (BEPZA)	Edison Global (Hongkong)	Diesel	Diesel	64.00
Duracom	First Private Power Corp.	Diesel	Diesel	247.00
Pinamucan(Enron)	Enron Power Corp. (USA)	Diesel	Diesel	110.80
Angeles PI DPP	Angeles Electric	Diesel	Diesel	30.00

	Corporation			
FPPC Bauang Dsl	First Private Power Corp.	Diesel	Diesel	235.20
Magellan Cogen (CEPZA)	Magellan Cogen Utilities	Diesel	Diesel	63.00
FCVC DPP	Cabanatuan Electric Corp.	Diesel	Diesel	32.00
Tarlac Electric	Tarlac Electric Inc.	Diesel	Diesel	12.60
San Antonio	Non-NPC	Combined Cycle	Natural gas	3.00
Sta. Rita Natural Gas	First Gas Power Corp	Combined Cycle	Natural gas	1,060.00
Ilijan	KEPCO	Combined Cycle	Natural gas	1,200.00
First Gas B	First Gas Power Corp	Combined Cycle	Natural gas	500.00
Hopewell GT	Hopewell Energy Int'l. Ltd.(Hongkong)	Gas Turbine	Fuel Oil	310.00
Limay CCGT	ABB/Marubeni/Kawasaki Consortium	Gas Turbine	Fuel Oil	620.00
MakBan Ormat	Ormat Inc. USA	Geothermal	Geothermal	15.70
Manito	Non-NPC	Geothermal	Geothermal	1.50
HEDCOR	Hydro Electric Dev't. Corp. (Phils.)	Hydro	Hydro	22.00
Mini-Hydro	NON-NPC	Hydro	Hydro	21.96
NIA-Baligatan	NON-NPC	Hydro	Hydro	6.00
NMHC	NMHC	Hydro	Hydro	6.00
Ambuklao	MIESCOR	Hydro	Hydro	75.00
Binga	Chiang Jiang Energy Corp.	Hydro	Hydro	100.00
Bakun	HEDCOR	Hydro	Hydro	70.00
Casecnan	NIA Philippines	Hydro	Hydro	140.00
Malaya 2	NPC-PO	Oil-Thermal	Fuel Oil	350.00
Malaya 1	NPC-PO	Oil-Thermal	Fuel Oil	300.00
ACMDC	Atlas Consolidated Mining & Dev't Corp.	Oil-Thermal	Fuel Oil	100.00
Cebu TPP1 (Naga)	Salcon Phils.	Oil-Thermal	Fuel Oil	50.00
Cebu TPP2 (Naga)	Salcon Phils.	Oil-Thermal	Fuel Oil	55.00
Panay Power Corp.	Panay Power Corp Corp.	Diesel	Diesel	74.88
PECO	Panay Electric Corp.	Diesel	Diesel	19.85
ACMDC	Atlas Consolidated Mining & Dev't Corp.	Diesel	Diesel	45.05
Cebu Private Power	Cebu Private Power	Diesel	Diesel	70.00
East Asia Utilities	East Asia	Diesel	Diesel	49.70
Cebu DPP1	Atlas Consolidated Mining & Dev't Corp.	Diesel	Diesel	43.80
Tongonan II & III (Leyte A)	PNOC Philippines	Geothermal	Geothermal	610.80
Janopol	Non-NPC	Hydro	Hydro	5.00
Mini-Hydro	Non-NPC	Hydro	Hydro	4.61
Mindanao Energy Systems	Mindanao Energy Systems	Diesel	Diesel	18.90
Cotabato Light	Cotabato Light	Diesel	Diesel	10.00
Davao Light	Davao Light	Diesel	Diesel	58.69
Gen Santos	Alsons/Tomen (Phil/Japan)	Diesel	Diesel	50.00
Power Barge 117	Mitsui/BWES (Japan/Denmark)	Diesel	Diesel	100.00
Mindanao PB Dsl II (Power Barge 118)	Mitsui/BWES (Japan/Denmark)	Diesel	Diesel	100.00
Western Mindanao Power Corp.	Alsons/Tomen (Phil/Japan)	Diesel	Diesel	100.00
Mindanao I (Mt. Apo)	PNOC Philippines	Geothermal	Geothermal	54.24
Mindanao II (Mt. Apo)	PNOC Philippines	Geothermal	Geothermal	54.24
Mini-Hydro	NON-NPC	Hydro	Hydro	13.00
Northern Mindanao Power Corp.	NON-NPC	Oil-Thermal	Fuel Oil	108.60
IPP Total				**6,705**

Source: Power Statistics, DOE

Annex 4: Projected electricity generation by type of fuel for 1995 to 2015

Year	Electricity Generation (MW)												Total MW
	Coal/Lignite		Natural Gas		Diesel/Fuel Oil		Others		Hydro + Geothermal		Biomass		
	MW	%	MW	%	MW	%	MW	%	MW	%	MW	%	
1995	241	6.3	-	-	2,178	56.9	-	-	1,412	36.9	-	-	3,830
1996	554	13.2	-	-	2,088	49.8	-	-	1,548	37.0	-	-	4,190
1997	841	18.5	1	0.0	2,182	48.0	-	-	1,519	33.4	-	-	4,543
1998	1,072	22.6	2	0.0	2,076	43.7	-	-	1,596	33.6	-	-	4,746
1999	1,277	27.0	2	0.0	1,347	28.5	-	-	2,104	44.5	-	-	4,730
2000	1,902	36.8	2	0.0	1,049	20.3	-	-	2,217	42.9	-	-	5,170
2001	2,146	39.9	97	1.8	1,126	21.0	-	-	2,003	37.3	-	-	5,372
2002	1,985	33.7	1,787	30.4	367	6.2	-	-	1,747	29.7	-	-	5,886
2003	2,335	36.5	1,804	28.2	426	6.7	-	-	1,833	28.6	-	-	6,399
2004	2,590	37.5	1,914	27.7	616	8.9	3	0.0	1,782	25.8	-	-	6,904
2005	2,732	36.9	2,227	30.1	517	7.0	9	0.1	1,909	25.8	1	0.0	7,395
2006	2,906	35.8	2,280	28.1	761	9.4	262	3.2	1,908	23.5	1	0.0	8,118
2007	2,911	32.6	2,359	26.4	1,207	13.5	543	6.1	1,914	21.4	8	0.1	8,942
2008	2,912	29.7	2,355	24.0	1,303	13.3	1,312	13.4	1,929	19.6	10	0.1	9,821
2009	2,905	26.9	2,344	21.7	1,417	13.1	2,185	20.2	1,941	18.0	11	0.1	10,804
2010	2,908	24.0	2,343	19.3	1,476	12.2	3,194	26.4	2,180	18.0	12	0.1	12,113
2011	2,798	21.1	2,249	17.0	1,137	8.6	5,094	38.4	1,970	14.9	14	0.1	13,262
2012	3,093	24.9	3,555	28.6	1,500	12.1	-	-	4,006	32.2	289	2.3	12,443
2013	3,502	27.2	3,555	27.6	1,500	11.6	-	-	4,044	31.4	289	2.2	12,889
2014	4,043	29.5	3,555	25.9	1,500	10.9	-	-	4,337	31.6	289	2.1	13,724
2015	4,129	28.5	3,555	24.5	1,500	10.3	-	-	4,689	32.4	621	4.3	14,494

Source : Philippine Energy Plan 2002-2011 and 1996-2025
Note : 1995-2001 – Actual data
2002-2011 – PEP 2002-2011
1012-2015 – PEP 1996-2025
Also available in GWh

Annex 5: The Government's 10-point Agenda for the Reduction of Electricity Rates

- Reflect the true cost of service in the rates
  - Billing statements should be transparent
    - Tariffs should be unbundled
- Introduce price incentives to stimulate demand
  - Introduce "Declining Block" rate structure
    - For large end-users, price per kwh declines as consumption increases
    - NPC to implement in partnership with Distribution utilities to jointly serve end-users
- Optimise the utilisation of generation capacity to minimise cost
  - Optimise utilisation Mix of NPC Power Plants
    - Utilisation mix to seek least blended costs
    - Independent systems review of Luzon Grid by the Operations Research Society of the Philippines
    - Redeploy power barges and relocate land-based generation plants from Luzon
    - Maintain sensible reserve capacity and alleviate transmission constraints
- Establish competitive wholesale generation market
  - Accelerate operation of WESM
    - Transparent economical dispatch of generating facilities
    - Horisontal unbundling of NPC generation assets into individual GENCOs to decentralise dispatch and pricing discretion
    - Immediately appoint an independent "IPP Administrator" for each IPP GENCO plant
    - Expedite procurement of required WESM software and hardware
    - Target interim WESM launch before end-2002
- Accelerate open access to give end-users the power of choice
  - Accelerate implementation of open access
    - End-users with at least 1 MW average monthly consumption may choose their electricity source
    - Target introduction by December 2003
    - Preserve direct power connection
    - Preconditions – unbundle distribution rates
      - operate interim WESM
    - remove cross-subsidies
- Require efficient performance of distribution utilities
  - Encourage shift from "cost plus" mentality to a "cost efficient" regime
  - Encourage transparent and competitive procurement
  - Accelerate transition from RORB to a performance-based methodology by December 2003
  - Undertake comparative efficiency ratings of Distribution Utilities
  - Promote competitive bidding for long-term power supply contracts
  - Ensure compliance with Distribution Code
- Strengthen the electric cooperatives
  - Promote the consolidation of smaller sub-performing Electric Cooperatives (e.g. Bicol Region)
  - Adopt the Big Brother-Small Brother Arrangement among Electric Cooperatives (e.g. Lanao)
  - Encourage Investment Management Contract (MCs) for suitable Electric cooperatives by private operators and well-run electric cooperatives (e.g. Aklan)

- Seek to reduce IPP Contract costs
  - Review IPP contracts and seek to reduce contract costs
    - Use appropriate benchmarks based on legal, financial, operating and technical standards
    - Seek to reduce stranded contract costs through –realignment of fixed and variable costs; eduction of minimum energy off-take and non-renewal of soon to expire contracts
- Explore financial engineering to reduce stranded costs
  - Refinancing of stranded costs over longer periods
  - Prepaid stored fuel/energy bankable for a certain period pending future use
  - "Regulatory asset" treatment of excess purchased fuel/energy to be included into the rate base
- Enhance ERC's capability to promote consumer welfare
  - Promote greater market competition through transparency of rules and strict enforcement of law on anti-competition policies
  - Penalise abuse of market power
  - Set rules to protect end-users from undue electricity charges
  - Protect consumers from excessive PPA charges from privately-negotiated bilateral contracts

Annex 6: Department of Environment and Natural Resources – Mission, Powers and Functions

The DENR's mission is to be the dynamic force behind people's initiatives in the protection, conservation, development and management of the environment through strategic alliances and partnerships, participate processes, relevant policies and programs and appropriate information technology towards sustainable development.

- To accomplish the department's mandate, the following objectives serve as basis for policy formulation:
- Assure the availability and sustainability of the country's natural resources through their judicious use and systematic restoration or replacement, whenever possible;
- Increase the productivity of natural resources in order to meet the demands for forest, mineral and land resources of a growing population in a manner consistent with environmental protection and enhancement;
- Enhance the contribution of natural resources for achieving national economic, political, social development and ecological integrity;
- Promote equitable access to natural resources by the different sectors of the populations;
- Maintain a desirable level of environmental quality;
- Conserve specific terrestrial and marine areas representative of the Philippine natural and cultural heritage for present and future generations.

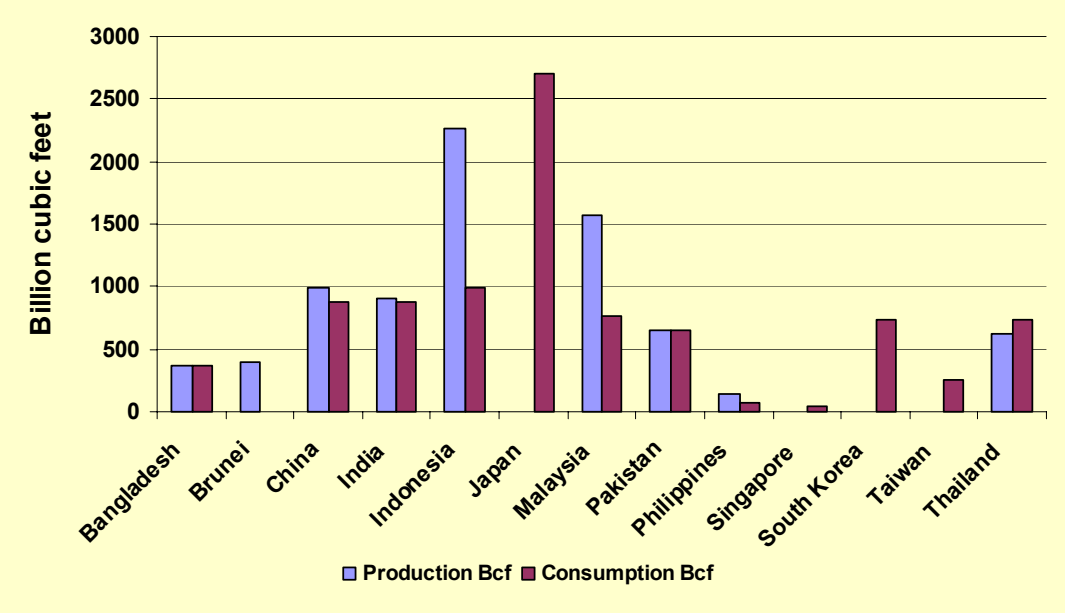
The powers and functions of the DENR are as follows:

- Advise the President on the enactment of laws relative to the development, use, regulation and conservation of the country's natural resources and the control of pollution;
- Formulate, implement and supervise the government's policies, plans and programs pertaining to the management, conservation, development, use and replenishment of the country's natural resources.
- Promulgate rules and regulations in accordance with law governing the exploration, development, conservation, extraction, disposition, use and such other commercial activities tending to cause the depletion and degradation of our natural resources;
- Exercise supervision and control over forest lands, alienable and disposable lands, and mineral resources and impose appropriate payments, fees, charges, rentals and any such form of levy and collect such revenues for the exploration, development, utilisation or gathering of such resources;

- Undertake exploration, assessment, classification and inventory of the country's natural resources using ground surveys, remote sensing and complementary technologies;
- Promote proper and mutual consultation with the private sector involving natural resources development, use and conservation;
- Undertake geological surveys of the whole country including its territorial waters;
- Establish policies and implement programs for the:
  a. Accelerated inventory, surveys and classification of lands, forest and mineral resources using appropriate technology, to be able to come up with a more accurate assessment of resource quality and quantity;
  b. Equitable distribution of natural resources through the judicious administration, regulation, utilisation, development and expansion of natural resource-based industries;
  c. Promotion, development and expansion of natural resource-based industries;
  d. Preservation of cultural and natural heritage through wildlife conservation and segregation of national parks and other protected areas;
  e. Maintenance of a wholesome natural environment by enforcing environmental protections laws; and
  f. Encouragement of greater people's participation and private initiative in natural resource management.
- Promulgate rules and regulations necessary to:
  a. Accelerate cadastral and emancipation patent surveys, land use planning and public land titling:
  b. Harness forest resources in a sustainable manner, to assist rural development, support forest-based industries, and provide raw materials to meet increasing demands, at the same time keeping adequate reserves for environmental stability; and
  c. Expedite mineral resources surveys, promote the production of metallic and non-metallic minerals and encourage mineral marketing.
- Regulate the development, disposition, extraction, exploration and use of the country's forestland and mineral resources;
- Assume responsibility for the assessment, development, protection, conservation, licensing and regulation as provided for by law, where applicable, of all natural resources; the regulation and monitoring of service contractors, licensees, lessees, and permittees for the extraction, exploration, development and utilisation of natural resource products; the implementation of programs and measures with the end in view of promoting close collaboration between the government and the private sector; the effective and efficient classification and sub-classification of lands of the public domain; and the enforcement of natural resources laws, rules and regulations;
- Promulgate rules, regulations and guidelines on the issuance of co-production, joint venture or production sharing agreements, licenses, permits, concessions, leases and such other privileges and arrangement concerning the development, exploration and utilisation of the country's natural resources and shall continue to oversee, supervise and police our natural resources; to cancel or cause to cancel such privileges and arrangements upon failure, non-compliance or violations of any regulations, orders, and for all other causes which are in furtherance of the conservation of natural resources and supportive of the national interest;
- Exercise exclusive jurisdiction on the management and disposition of all lands of the public domain and shall continue to be the sole agency responsible for the classification, sub-classification, surveying and titling of lands in consultation with appropriate agencies;
- Implement measures for the regulation and supervision of the processing of forest products, grading and inspection of lumber and other forest products and monitoring of the movement of timber and other forest products.
- Promulgate rules and regulations for the control of water, air and land pollution; Promulgate ambient and effluent standards for water and air quality including the allowable levels of other pollutants and radiations;
- Promulgate policies, rules and regulations for the conservation of the country's genetic resources and biological diversity, and endangered habitats; which will be presented to the Cabinet for the President's approval;

- Formulate an integrated, multi-sectoral, and multi-disciplinary National Conservation Strategy, which will be presented to the Cabinet for President's approval;
- Exercise other powers and functions and perform such other acts as may be necessary, proper or incidental to the attainment of its mandates and objectives.

Annex 7: Natural Gas Production and Consumption of Asian Countries*



Source of Data : BP Amoco Statistical Review
Note : *Phil- 2002 data; all other countries- 2000

ANNEX 8: Proposed Gas Pipeline Infrastructure

Source: THE PHILIPPINE NATURAL GAS INDUSTRY: Vision, Strategy and Policy, A Briefing for the Proponents of House Bill No. 4754, Presented on February 5, 2003 in Quezon City, Philippines by the Philippine Department of Energy.

ANNEX 9: Location of Petroleum Resources

Source: THE PHILIPPINE NATURAL GAS INDUSTRY: Vision, Strategy and Policy, A Briefing for the Proponents of House Bill No. 4754, Presented on February 5, 2003 in Quezon City, Philippines by the Philippine Department of Energy.

The petroleum resources are found in 16 sedimentary basins with an area of over 700,000 sq. km.

- Ilocos
- Cagayan
- Central Luzon
- West Luzon
- Southeast Luzon
- Bicol Shelf
- Mindoro - Cuyo
- Northwest Palawan
- Southwest Palawan
- East Palawan
- Reed Bank
- West Masbate / Iloilo
- Visayan

- Cotabato
- Agusan - Davao
- Sulu Sea

Annex 10: Power Transmission Development:

For the next ten years, TRANSCO has identified a total of 11,815 ckt-kms of transmission lines and 26,565 MVA of substation capacity which need to be installed in the country. These consist of 1,998 ckt-kms of transmission lines and 3,230 MVA of substation capacity classified as ongoing projects; 2,775 ckt-kms of transmission lines and 11,170 MVA of substation capacity classified as projects for implementation and 7,024 ckt-kms of transmission lines and 12,165 MVA of substation capacity classified as indicative projects.

Annex 11: Power Sector Development Highlights as in the Philippines Energy Plan 2002 – 2012:

Investment Strategy in the Power Sector

The DOE has published the 10-year Transmission Development Plan (TDP). This TDP has been prepared by the National Transmission Corporation (TRANSCO) to comply with its mandate under Section 9(f) of Republic Act 9136, the Electric Power Industry Reform Act of 2001 (EPIRA). The Plan sets out the manner in which TRANSCO aims to promote reliable, adequate, secure, and stable service for all users of the nation-wide electricity transmission system. It reflects the planning criteria documented by the Philippine Grid Code and the performance targets established by the Energy Regulatory Commission. The Plan also provides an indicative capital investment program for the identified projects and programs.

The 2003 Investments Priorities Plan which has been approved by the President on April 14, 2003 (Memorandum Order No. 95) stated that at the national level, the government programs related to Energy Sources (i.e.: exploration/development of indigenous, new and renewable energy sources and technologies, including natural gas, and establishment of mini-hydro electric power plants) are supported. While at the regional level, the electric transmission and distribution and power generation (like hydro power and geothermal) are included in the investments priorities area.

"PPA" and the Overcapacity in Power Generation

The "purchased power adjustment" or PPA has attracted a lot of attention. The Purchased Power Cost Adjustment (PPCA) is a component of the Fuel and Purchased Power Adjustment (FPCA). It reflects the movements in the cost of power that NPC buys from its Independent Power Producers (IPPs). NPC has been authorised by the then ERB (now ERC) to collect these charges from power distributors. The Purchased Power Adjustment (PPA), on the other hand, reflects all the adjustment charges of NPC, plus the changes in the cost of power the distributors buy from suppliers other than the NPC. The PPA also includes system losses and other authorised adjustments.

The PPA represents the incremental cost of generation over a base cost using 1995 levels. The foreign exchange rate and the cost of fuel (oil and coal) are the principal drivers of the PPA. The high levels of the PPA stem from an overcapacity situation in power generation. The current level of overcapacity is estimated at 2,000 MW. On the customer electric bills, the PPA charge has reached parity with the basic charge, giving the impression that the public is being asked to "pay for power that they do not use". Public hearings are held to allow all parties concerned to air their views and clarify issues with the petitioner. These public hearings are conducted with the petitioner and designated representatives of all parties concerned in attendance. The schedule of hearings of unbundled rates applications is published in newspapers and/or announced through radio and television. Under R.A. No.9136, the ERC is mandated to act on the unbundling of rates applications on or before six (6) months from the time the utility has fully or substantially complied with the Uniform Filing Requirements (UFR) prescribed by the Commission.

On the other hand, the power transmission and distribution systems remain fragile. This has led to a spate of Luzon-wide blackouts that belie government's claims of overcapacity. The power situation, therefore, is a paradox to most. There is overcapacity and yet electric power blackouts seem to prevent. There is limited public discussion about the complexity of the problem and the risks attendant to proposed solutions. Most of the media coverage is focused on the consumer view of high power rates.

Business Opportunities in the Power Sector

Privatisation
- Privatisation of NPC
    - TRANSCO Concession
    - Genco Sale
- Long-Term Debt Financing for new GENCOs

Oil and Gas
- Gas Pipeline Financing
- Exploration and development of natural gas sites adjacent to the Malampaya deepwater project infrastructures pursuant to the Window of Opportunity Program
- Exploration/Development of petroleum basins

Others
- Green and brown-field development of natural gas plants
- Further development of geothermal resources
- Development of New and Renewable Energy resources.

Annex 12: Some Restructuring in the Power Sector:

President Arroyo approved the sale plan for the government's power generation and transmission assets. Some of the salient features of the sale plan are as follows:

- Privatise TRANSCO through concession and NAPOCOR through outright sale; Award the contracts after open and competitive bidding
- Privatisation of transmission assets will be done prior to the sale of generation assets by means of a concession contract for a period of 25 years renewable for another 25 years.
- The TRANSCO concessionaire will finance, operate, expand and manage TRANSCO's transmission facilities
- Payment terms for the concession fee will be defined in the bidding rules which will also provide, among others, for the payment in cash of 25% of the present value of the total consideration with the balance payable over a period not exceeding over 25 years.
- 50% of the foreign equity component of the concessionaire will be in foreign currency.
- Outright sale for NAPOCOR's power generation assets, real estate and contracts with Independent Power Producers through public bidding.

Annex 13: National Transmission Corporation (TRANSCO)

TRANSCO will have to wait for the guidelines to be issued by the Energy Regulatory Commission before it gets ahead with plans to sell its sub-transmission assets to qualified distribution utilities. Public hearings on said guidelines have already been conducted but the contentious issues have yet to be resolved.

The first bidding for the privatisation of the TRANSCO assets was held during the week of July 14. It was declared as a failed bid because only one party, Singapore Power, submitted a pre-qualification proposal. On August 6, the process for the second bidding commenced. Once again, only Singapore Power submitted its Second Expression of Interest. Accordingly, on August 27, the

privatisation bidding and contracts committee declared a second failure of bids. The Power Sector Assets and Liabilities Management (PSALM) Board has authorised the PSALM Management to initiate negotiations with Singapore Power pending receipt of proper legal opinion from the Office of the General Corporate Council.

On the TRANSCO Privatisation, the National Transmission Company (TRANSCO) and the Singapore Power Corporation, the lone entity that signified interest to bid for TRANSCO assets valued between $2 Billion and $3 Billion are set to begin negotiations by February 2004. Recently, however, a Finnish power firm has expressed interest in bidding for the TRANSCO assets

Republic Act No. 9136, also known as the "Electric Power Industry Reform Act of 2001" (EPIRA), mandates the Department of Energy (DOE) to establish the WESM within one (1) year from its effectivity. The Act also mandates the DOE, jointly with the electric power industry participants, to formulate the detailed rules for the WESM.

Annex 14: The Wholesale Electricity Spot Market (WESM)

The WESM is the market where trading of electricity will be made. It shall be governed by the Philippine Electricity Market Board (PEM Board). The PEM Board shall provide the policies and guidelines of the WESM contained in the Implementing Rules And Regulations of the Act, WESM Rules, and such other relevant laws, rules and regulations.

The Market Operator, a non-stock, non-profit organisation, shall administer the operation of the WESM in accordance with the WESM Rules. For the first year, the Market Operator's functions shall be provided by the Autonomous Group Market operator (AGMO) under the administrative supervision of the National Transmission Corporation (TRANSCO). After the first year, the Market Operator shall be an independent entity. Thereafter, the administrative supervision of the TRANSCO over such entity shall cease.

The WESM rules is organised into eleven (11) Chapters. These are:
Chapter 1. Introduction
Chapter 2. Registration
Chapter 3. The Market
Chapter 4. Metering
Chapter 5. Market Information and Confidentiality
Chapter 6. Intervention and Market Suspension
Chapter 7. Enforcement and Disputes
Chapter 8. Rules Change Process
Chapter 9. Interpretation
Chapter 10. Transitory Provisions
Chapter 11. Glossary

For more information, visit the official WESM website at http://www.wesm.ph

The trial operation of the WESM will commence on June 2004. Such optimism is anchored on the recent approval of the financing for the WESM by the Japan Bank for International Cooperation (JBIC).

The Asian Development Bank expects the Government to bid out and award the project's turnkey contract for the establishment of the Wholesale Electricity Spot Market by the third quarter of the year. As part of the preparations, the National Transmission Corporation, the executing agency for the project, earlier created a special bid and awards committee to handle the procurement of supplies and information technology-related system for the WESM as well as the selection of consulting services.

The tendering process for the selection of the Project Management and Market Management System Consultants was completed in September 2003. The operation of the DEMO WESM

market is scheduled during the last quarter of the current year. Project implementation of the market management system is targeted in 2004.

By February 2004, TRANSCO expects to put in place the Market Management System (MMS) which will provide the required infrastructure-hardware and software to manage the bidding, pricing and settlement functions of the WESM. The Philippine Electricity Market Corporation would act as the WESM operator. The new WESM office is located at the Robinsons-Equitable Tower in Ortigas Center, Pasig City. The Asian Development Bank had extended $40 million in financial assistance for the establishment of the power market.

Under the proposed WESM structure, the generation companies will submit offers on an hourly basis. A generator which would like to receive priority dispatch of electricity into the system must submit a very low price offer. Price offers received by the market will be ranked accordingly from the lowest to the highest. Suppliers submitting very high price offers may run the risk of not being dispatched given the forecast demand for the hour. It is anticipated that once the WESM is established, electricity cost in the country would go down by about 40 centavos per kilowatthour.