

I. EXECUTIVE SUMMARY

Executive Order No. 66, signed on January 18, 2002 by President Gloria Macapagal-Arroyo, designated the Department of Energy (DOE) as the lead agency for the development of the country's natural gas industry. To fulfill this mandate and to ensure that the benefit from the industry's development accrue to the Filipino people, the DOE has drawn up this policy and regulatory framework for the development of the Philippine natural gas industry particularly its downstream sector.

The birth of the country's natural gas industry was marked by the successful launching of the Malampaya Deep Water Gas-to-Power Project in October 16, 2001. With an initial production capacity of 400 million standard cubic feet per day (MMSCFD), the country's first commercial gas discovery from the Malampaya gasfield will supply fuel to 2,760 megawatts (MW) of installed power generation capacity. The development of this and other gas reserves advances the country's goal of a stable and secure energy supply and a clean environment while providing additional benefits in the form of added revenues and employment.

Apart from the proven gas reserves in the Malampaya gasfield estimated at 3.7 trillion cubic feet (TCF), a recent assessment of the petroleum resources in the Philippines indicates substantial gas resources that are yet to be discovered of about 24.7 TCF, making the country a promising site for renewed exploration in the Asian region. Moreover, the Philippines has potentially competitive options to import natural gas from its gas-rich neighbors primarily in the form of Liquefied Natural Gas (LNG) or piped gas through the Trans-ASEAN Gas Pipeline (TAGP).

While demand for natural gas is expected to come mainly from power generation, the DOE shall however actively promote the increased used of competitively-priced natural gas in the non-power sector consistent with the agency's thrust towards the use of cleaner fuels.

Additional demand for gas is expected to come mainly from new power plants that would be needed to fill the expected gap in generating capacity starting 2008 for the island of Luzon. The Philippine Energy Plan (PEP) for 2003-2012 projects as much as 4,200-MW of potential gas-fired generating capacity that may be needed between 2005 and 2012. Demand for non-power use is estimated at one billion cubic feet (BCF) by 2005 and 16 BCF by 2012. A 1999 study funded by the Asian Development Bank (ADB), however, estimated a potential demand for non-

power use of up to 160 BCF for Luzon provinces alone, assuming that a pipeline could be built from Batangas province to Manila and all the way to Bataan.

The development of the gas market will be anchored on the development of a transmission and distribution infrastructure which includes a network of transmission and distribution pipelines, ancillary facilities, LNG terminals and refilling stations for natural gas vehicles (NGV) that would enable new gas supplies to be developed and brought to the potential gas markets. Its expansion will be facilitated by focused policy measures that are intended to make the price of natural gas competitive with other fuels and reduce the cost of conversion to natural gas.

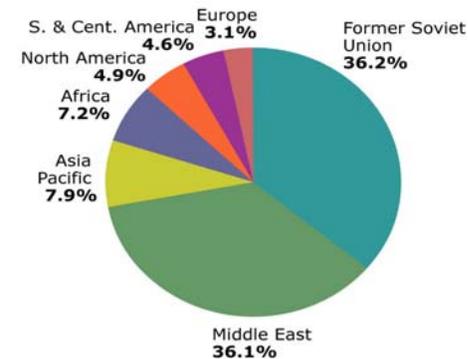
This Policy Paper embodies the policies, objectives, programs and strategies of the DOE for developing a natural gas industry in the Philippines in the context of current gas supply and demand prospects, the industry's existing stage of development and an environment that encourages investments, promotes economic efficiency and maximizes consumer welfare. It is also intended to serve as a reference document for the on-going deliberations, in Congress of a proposed legislative measure to govern the development of the downstream natural gas industry, and companion to the DOE Circular entitled "Interim Rules and Regulations Governing the Transmission, Distribution and Supply of Natural Gas."

II. POLICIES, OBJECTIVES AND THE ROLE OF GOVERNMENT

Natural gas has become the fuel of choice for many modern economies because of its abundance, clean-burning properties and versatility as a fuel source. As a result, between 1991 and 2001, total world consumption of natural gas increased from 2.0 Trillion Cubic Meters (TCM) to about 2.4 TCM. Moreover, it is forecasted that primary gas consumption will double between 2002 and 2030, and that the share of gas in terms of energy demand will increase to 28 percent from the current level of 23 percent¹. Proven global reserves of natural gas, estimated at around 155 TCM as of end 2001², are more widely distributed globally compared to oil, and such reserves purportedly contribute only a small fraction of the methane found in the earth’s crust (see Figure 1). At 2001 production levels totaling 2.5 TCM, British Petroleum (BP) estimates that world gas reserves will last for another 61 years, compared to only 40 years for oil.

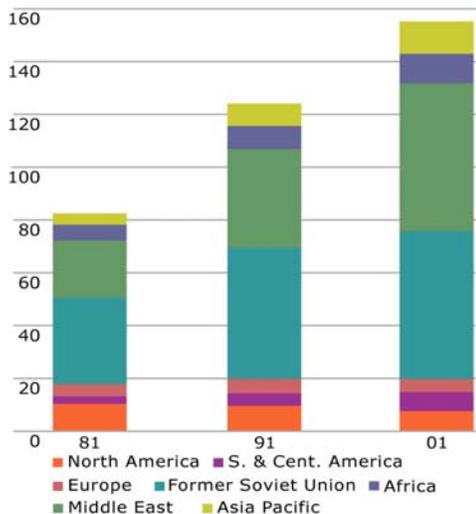
distribution of proved natural gas reserves 2001

Trillion cubic metres %



proved natural gas reserves

Trillion cubic metres



bp statistical review of world energy 2002

Figure 1. Estimate of global natural gas reserves from BP.

¹ International Energy Agency (IEA) 2002 World Energy Outlook.

² BP Global Statistical Review of World Energy, June 2002.

In the case of the Asia Pacific region, the distribution of natural gas reserves appears more widespread and equitable. As shown in Figure 2, the Philippines is surrounded by economies with significant gas reserves which implies greater accessibility to supply sources.

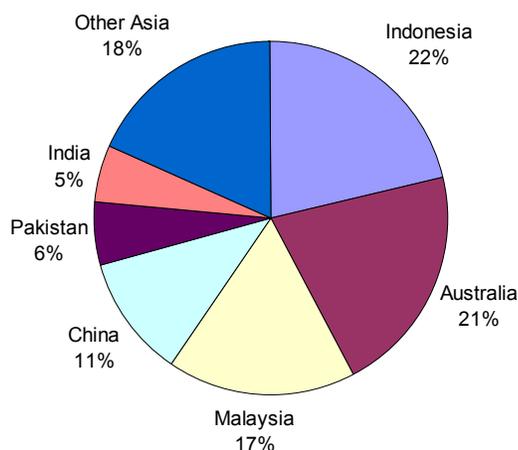


Figure 2. BP Estimates that proven reserves of natural gas in the Asia Pacific region as of end 2001 are about 433 TCF.

Nevertheless, updated data from the Philippine Petroleum Resources Assessment (PhilPRA) Project³ indicates a potential of up to 28.5 TCF of gas in the country. Such advantages augur well for the critical role that natural gas will play in the government’s key energy sector goals to ensure a stable, secure, clean and efficient energy supply at fair and reasonable prices.

Because of its composition, natural gas is also more environment-friendly, as methane molecules contain more hydrogen and less carbon than molecules of other organic fuels such that its combustion produces less carbon dioxide and “greenhouse” atmospheric warming effect per unit of useful energy than coal, oil or biomass. Also, improving combined cycle gas turbine (CCGT) technology will lead to a higher energy-conversion efficiency and translate to lower capital costs.

³ A joint project undertaken by the DOE and the Norwegian Agency for Development Cooperation (NORAD) which was completed on March 2002.

Natural gas competes with energy sources in almost every application, be it in power generation or in industrial, residential and transport use. With existing CCGT technology for the generation of electricity which is seen to further improve within the next few years, conversion costs have become lower than for any other primary energy source. Moreover, greater efficiency factors have improved the business case proposition for gas-fired plants.

A. Policies and Objectives for the Downstream Natural Gas Industry

Within the context of the country's broader energy sector goals, the policies and objectives for the development of the Philippine downstream natural gas industry have been crafted to ensure an efficient, coordinated and integrated approach. In this regard, the Philippine Energy Plan (PEP)⁴ for the planning period 2003-2012 continues with the macro-economic goals of the Arroyo administration to promote balanced economic growth, poverty alleviation and a market-based energy industry. From the national government's macro-economic goals, the DOE has formulated energy sector goals which represent its macro-economic goals for the energy sector.

These energy sector goals and their relationship with the policies and objectives of the DOE for the development of the Philippine downstream natural gas industry are illustrated in Table 1. These gas policies were formulated to serve as the blueprint for the development of the industry. In the same way, the objectives were identified to ensure that enunciated policies are attained.

B. Role of Government

The National Government shall lead the development of the upstream and downstream sectors of the natural gas industry. As a matter of policy, the financing, construction and operation of natural gas infrastructure projects in the downstream sector shall be left to the private sector with the government limiting itself to the formulation and implementation of strategies and programs conducive to the industry's growth and, where necessary, for the efficient management of strategic gas infrastructure projects. In instances where a strategic gas infrastructure project

⁴ An annual plan submitted by the DOE to Philippine Congress every 15th of September which contains the government's policies, strategies, objectives and programs for the country's energy sector.

Table 1. PEP Energy Sector Goals, Gas Policies and Objectives.

Energy Sector Goals	Gas Policies	Gas Objectives
Stable and secure energy supply	Promote natural gas as a secure, stable and economically efficient source of energy	Increased share of natural gas in the energy and power mix while maintaining a diversified fuel mix
Wider access to energy supply	Promote competition by liberalizing entry and adopting competition and fair trade measures with due regard to public welfare and the financial viability of industry participants	Increased utilization of natural gas as fuel in the power and non-power sectors
Fair and reasonable energy prices	Promote natural gas as an environmentally friendly source of energy	Competitive natural gas prices vis-à-vis other fuels in a regulated market which eventually transforms into a deregulated market characterised by gas-to-gas competition and market based transactions
Clean and efficient energy fuels and infrastructure	Ensure compliance with international safety standards and Philippine environmental laws, rules and regulations	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 being undertaken
Enhanced consumer welfare and protection		Increased economic benefits to consumers
Technology transfer and manpower development		
Job creation from energy activities		

needs to be initiated, however, the government may take a lead investing role through the Philippine National Oil Company (PNOC) to spur project commencement.

For upstream gas exploration and development, the government will maintain its current role of promoting exploration activities through joint production-sharing contracts with exploration companies. To encourage further interest from upstream exploration companies, the current service contracting arrangements shall be revisited.

III. CURRENT GAS INDUSTRY SITUATION

A. Potential Gas Demand and Markets

The PEP is a blueprint prepared annually by the DOE to chart the course of the country's energy sector over short to long term horizons. This year's PEP covers a ten year planning horizon from 2003 to 2012 and expounds on the country's evolving primary energy mix, power sector profile and other sectoral plans and programs.

Based on planning parameters consisting mainly of GDP growth, population increase, foreign exchange behavior and crude price forecasts over the ten year planning period⁵, total potential demand for gas is expected to increase from about 94 BCF in 2003 to 147 BCF in 2008 and further to 182 BCF by 2012 (see Table 2).

Table 2. Total Demand for Natural Gas in BCF, 2002 and 2012 (2003-2012 PEP).

	2002	2003	2004	2005	2008	2010	2012
Power	73	94	108	114	138	161	166
Non-Power	0	0	0	1	9	9	16
Total	73	94	108	115	147	170	182

A significant component of this total energy mix consists of power demand, which is likewise expected to significantly increase over the next ten years. To meet the forecasted rise in electricity demand, a total of 7,150 MW of capacity needs to be commissioned within the second half of the planning period, of which 1,000 MW is considered as committed capacity⁶. This translates to required indicative capacity additions of 4,500 MW for Luzon starting in 2008, 950 MW for the Visayas beginning in 2005 and 700 MW for Mindanao starting also in 2005.

⁵ Base Case GDP is expected to reach Php 1.1 trillion in 2003 and Php 1.3 trillion in 2007. Average annual GDP growth rate for 2003-2012 is estimated at 5.4 percent. US Dollar-Php exchange rate is pegged at USD \$1 to Php 51 while crude oil prices are forecasted at US\$ 25/bbl.

⁶ Refers to portion of total capacity requirement that has been awarded and currently in advanced state of development, financing and construction

Out of the total required capacity, it is estimated that as much as 4,200 MW, or 93 percent of the estimated requirements in Luzon, could be fueled by natural gas. As a component of the power mix, generation from gas-fired facilities is seen to increase from 18.2 percent in 2002 to 26.6 percent in 2007.

It is therefore evident that power generation will account for the bulk of natural gas demand over the planning period, comprising 100 percent of total demand in 2003 and tapering off to 91 percent in 2012. Non-power demand is expected to come mainly from the industrial, transport, commercial and residential sectors. For the latter two sectors, natural gas is seen as a potential substitute for commercial and residential Liquefied Petroleum Gas (LPG)⁷.

Increased utilization from the transport and industrial sectors is expected following the implementation of fiscal⁸ and non-fiscal measures designed to reduce the cost of converting diesel-fueled vehicles to CNG, enhance the competitiveness of gas vis-à-vis other fuels for cooling and heating applications and increase the profitability of investments in the required infrastructure and facilities. A study undertaken by the Japan International Cooperation Agency (JICA) in 2000-2001 of the potential demand for the non-power sector is consistent with the energy demand projections for the 2003-2012 PEP (Table 3).

Table 3. Potential Gas Demand By Non-Power Sector in Million Standard Cubic Feet per Day (MMSCFD).

Sector	2000	2005	2010	2015	2020	2025
Total	7.54	5.01	27.60	68.16	120.17	176.37
Industrial	0.21	0.26	0.59	1.07	1.70	2.47
Transportation	0.02	0.02	0.03	0.05	0.07	0.09
Residential	3.07	3.52	18.86	49.27	87.91	127.85
Commercial	4.25	1.20	8.11	17.76	30.48	45.96

Source: JICA Masterplan Study

⁷ ADB/FEMG. 2000. *Gas Sector Policy and Regulatory Framework Project. ADB TA 2826: Philippines. Final Report.* and JICA/IEE Japan. *A Master Plan Study on the Development of the Natural Gas Industry in the Republic of the Philippines, Final Report, January 2002*

⁸ As provided for in the 2002 Investment Priorities Plan (IPP) where CNG was given pioneering status entitling investors to certain incentives

Power Generation

As projected in the 2003-2012 PEP, power demand on a base case GDP outlook for the country will outstrip existing capacity by 2007 and committed capacity by 2008⁹. For the Luzon grid, peak demand is expected to cross over the existing capacity threshold by 2008 and the committed capacity by 2009. These trends imply that to meet new capacity requirements, power plant construction must commence by 2003 even for short-gestation power plants such as gas-fired CCGT plants.

Given the current restructuring of the Philippine electric power industry and the stringent environmental standards for the Luzon grid, particularly in Metro Manila, additional gas-fired capacity should be strategically and effectively deployed within a relatively short period of time. Among the range of potential green and brown field candidates that can fill the needed capacity requirements is a converted Sucat thermal plant located in Metro Manila. Another potential candidate for conversion is the 600-MW Limay thermal power plant in the Bataan peninsula which currently uses bunker and diesel fuel. Both the Sucat thermal plant and the Limay thermal plant are ideal candidates for conversion into natural gas and are among the National Power Corporation (NPC) generating assets that would be privatized pursuant to the NPC privatization plan prepared under R.A. 9136 or the Electric Power Industry Reform Act of 2001 (EPIRA). The DOE, through the Power Sector Assets and Liabilities Management Corporation (PSALM), the government owned corporation tasked with selling these assets, may in fact mandate that any buyer of the Sucat, Limay and other selected power plants should convert them to natural gas fuel when commercially justified.

Industrial Sector

Clustered industries along the proposed pipeline routes linking Batangas province and the Bataan peninsula to Metro Manila are targeted for conversion to natural gas for their process heat, air conditioning and power requirements. Within the Batangas-Manila industrial corridor, for example, there are more than 20 industrial parks or economic zones

⁹ Committed capacity was derived from a pre-R.A. 9136 scenario and may change upon the implementation of the power sector restructuring. Current capacity is pegged at 1,000 MW

with multiple locators that can harness natural gas for their various needs. For the Bataan-Manila pipeline, the Clark Special Economic Zone in Pampanga and Subic Freeport Zone in Olongapo are ideal candidates. Both ecozones host numerous industries that have stringent requirements for quality electric power and heating. These parks are ideal candidates for industrial gas distribution as they are also most susceptible to pricing differentials between natural gas and purchased power.

Transport Sector

Consistent with its policy to promote the use of environmentally friendly fuels, and pursuant to the environmental programs currently being implemented by the National Government, the DOE is aggressively promoting fuel options for vehicles that would emit less harmful exhaust. With Metro Manila as the initial targeted area, the DOE has a long-term program for converting public transport vehicles such as buses, taxis and jeepneys to run on CNG.

To promote the use of CNG in the public transport sector starting with the public utility buses and in order to further reduce our dependence on oil and encourage the use of clean fuels in the transport sector, President Macapagal-Arroyo, in simple ceremonies marking the first year anniversary of the Malampaya Deep Water Gas-to-Power Project on October 16, 2002, launched the Natural Gas Vehicle Program for Public Transport aiming to convert up to 100 public transport buses or import the same number of Original Equipment Manufactured (OEM) buses to run on CNG by 2003. The President announced the following initiatives:

- The Department of Trade and Industry (DTI) was to classify natural gas conversion kits as spare parts to bring tariff down to one percent
- The Board of Investments (BOI) was going to enhance the existing package for natural gas conversion kits, OEM buses and other related-facilities
- The Department of Transportation and Communication (DOTC), through the Land Transportation Office (LTO) will consider as having complied with emission standards buses which run on CNG

- The DOTC, through Land Transport Franchising and Regulatory Board (LTFRB) shall grant three franchises for natural gas bus fleets, two for the Batangas-Manila route and one for the Batangas-Bicol route
- The Department of Environment and Natural Resources (DENR) shall fast track the issuance of the Environment Compliance Certificates (ECC) needed for CNG facilities and refilling stations
- The Development Bank of the Philippines (DBP) shall establish a financing window to promote the use of natural gas vehicles and related infrastructure facilities
- The Department of Science and Technology (DOST) will promote and develop locally manufactured conversion kits
- The Metro Manila Development Authority (MMDA) intends to open C5 highway to buses using CNG

Moreover, the establishment of a network of CNG refilling stations, initially to service the needs of the pilot project and later on expanding to service a wider coverage area, is likewise being studied, either by existing or new petroleum retail chains. President Arroyo encouraged private players to participate in the establishment of such facilities. In order to integrate and coordinate its programs in this area, the DOE is formulating its *Natural Gas Vehicle (NGV) Framework*, which shall serve as the blueprint for the development and commercialization of NGVs in the country. The DOE shall advocate a pricing scheme for CNG that is significantly below the current retail price for diesel to sustain the introduction of NGVs.

Commercial and Residential Sectors

For the commercial sector, gas could be an alternative to electricity for airconditioning and lighting use. The anticipated expanded use of natural gas in the other sectors, particularly the transport sector, should lead to the establishment of a gas distribution network of pipelines. As this evolves, buildings, commercial establishments, shopping centers and big energy consumers such as the airport terminals and medical centers will gain access to natural gas.

The DOE is promoting the use of natural gas for cogeneration in these sectors, particularly for those areas that shall have access to the proposed gas pipelines and LNG storage facilities. The airport terminals and Bonifacio Global City development in Metro Manila are also prime candidates for conversion to natural gas. On the other hand, the principal opportunity for gas use in the residential sector is as a replacement for LPG as cooking fuel.

To supply potential commercial and residential gas needs, a city gas pipeline system could be established along the 40-km. EDSA-Taft avenue route which links to an existing LPG pipeline of the Manila Gas Corporation. This loop could source its supply from either Batangas or Bataan.

B. Supply

The Philippines, while not endowed with natural gas in the same quantities as its neighboring ASEAN economies, could access multiple sources of supply. These include the Malampaya gasfield, other undiscovered indigenous gas reserves and imported natural gas either in LNG form or via cross-border pipelines.

The Malampaya Gas-to-Power Project

With proven reserves of about 3.7 TCF of gas, 85 million barrels of condensate and at least 20 to 40 million barrels of oil, the Malampaya gasfield is the biggest and by far only the second commercial gas discovery in the Philippines to date. Prior to its discovery, natural gas production came from a nominal gasfield in San Antonio, Isabela province, which was discovered and is currently being developed by the Philippine National Oil Company-Exploration Corporation (PNOC-EC) to supply gas to a 3-MW power plant utilized principally for rural electrification.

Located 850 meters deep offshore northwest Palawan, an island situated in the South China Sea within the southwestern side of the Philippines, the gasfield is being

developed by a consortium led by Shell Philippines Exploration BV (SPEX)¹⁰ under a service contract entered into with the National Government through the DOE. With a total package investment of about US\$ 4.5 billion, the deepwater gas development venture includes the construction of a 504-km., 24-inch deepwater pipeline that transports the gas to Batangas in the island of Luzon, and three power facilities with an aggregate installed capacity of 2,760 MW (Figure 3).



Figure 3. The existing downstream natural gas sector is composed mainly of three power plants with a total capacity of 2,760 MW.

The National Government facilitated the creation of the initial downstream market needed by the consortium to proceed with the development of the gasfield. It was the NPC, the state power utility, that provided part of the required power market via a 1,200-MW CCGT plant in Ilijan, Batangas, constructed and operated by KEPCO Ilijan Corporation (KEILCO), a project company of the Korea Electric Power Company (KEPCO), under a Build-Operate-Transfer scheme. For the balance, First Gas Holdings

¹⁰ The original developer of the Camago-Malampaya gasfield consisted of SPEX and Occidental Petroleum Philippines, Inc. (“Oxy”), the latter having discovered the resource in 1989. In 1998, Oxy relinquished its share to SPEX as part of a worldwide rationalization of its petroleum interests. In 1999, SPEX farmed out 45% and 10% of the equity shares, respectively, to Texaco Philippines, Inc. and PNOC-EC. SPEX remains as the operator of the Service Contract.

Corporation (FGHC) put up the 1,000-MW CCGT Sta. Rita power plant and the 560-MW San Lorenzo power plant with electricity output being sold to Manila Electric Company (MERALCO), an affiliated distribution utility. These two power plants are likewise located in Batangas province.

From gas landfall in Tabangao, Batangas province, gas is transported to these power plants through individual pipelines, particularly a 12-km. onshore pipeline for Ilijan, and a 10-km. onshore pipeline for the Sta. Rita and San Lorenzo plants.

Indigenous Resources and Reserves

The Malampaya gasfield is located in the Northwest Palawan basin, one of 16 petroleum basins in the country covering an area of more than 700,000 sq. km. Results of the PhilPRA project completed in January 2002 show that the number of petroleum basins in the country increased to 16 from the 13 earlier identified in 1986. These identified petroleum basins are: Northwest Palawan, Southwest Palawan, Central Luzon, Visayan, Mindoro-Cuyo, Cagayan, East Palawan, Southeast Luzon, Reed Bank, Cotabato, Agusan-Davao, Sulu Sea, West Luzon, Ilocos, Bicol Shelf and Iloilo-West Masbate.

Moreover, qualitative and quantitative assessments disclose that the country's total petroleum resources — oil, natural gas and condensate – amount to about 8.895 billion barrels of oil equivalent (BBOE) (See Table 4). Of this total, the discovered resources, or those found from wells that have been drilled, have a total volume of 973 Million Barrels Oil Equivalent (MMBOE).

Table 4. Philippine Petroleum Resources.

Resource Class	Total MMBOE (Mean)	Oil MMbbl	NGas BCF (Mean)	Condensate MMbbl
Total Resources	8,895	3,629	28,531	164
Discovered Resources	973	168	3,841	109
Reserves	836	43	3,772	109
Potential Recoverable Resources	137	125	68	0
Undiscovered Resources	7,922	3,461	24,690	55
Hypothetical (Mapped Resources)	2,848	1,341	8,112	55
Speculative (Mapped Resources)	5,074	2,120	16,578	0

On the other hand, undiscovered resources, or those that have a high potential of being found from wells that are yet to be drilled, are expected to reach 7.9 BBOE. Of total petroleum resources, oil could amount to as much as 3.629 billion barrels of which the discovered resources amount to some 168 million barrels while the undiscovered resources could hit as much as 3.461 billion barrels.

Reserves are quantities of petroleum which are anticipated to be commercially recoverable and for which the DOE has formulated an aggressive and integrated development plan. Potential resources, on the other hand, are large volumes of known resources which, as of yet, cannot be produced due to economic and technological constraints. The undiscovered oil potential totals 1.34 billion barrels in hypothetical or mapped resources and 2.12 billion barrels in speculative or unmapped resources.

Natural gas, on the other hand, amounts to 28.53 TCF classified as 3.84 TCF in discovered resources and 24.69 TCF in undiscovered resources. Of the discovered gas, some 3.77 TCF is considered as reserves and 68 BCF as potential. Meanwhile, condensate resources are estimated to reach 165 million barrels of which 109 million barrels are classified as reserves and 55 million barrels are characterized as hypothetical resources.

Import Options

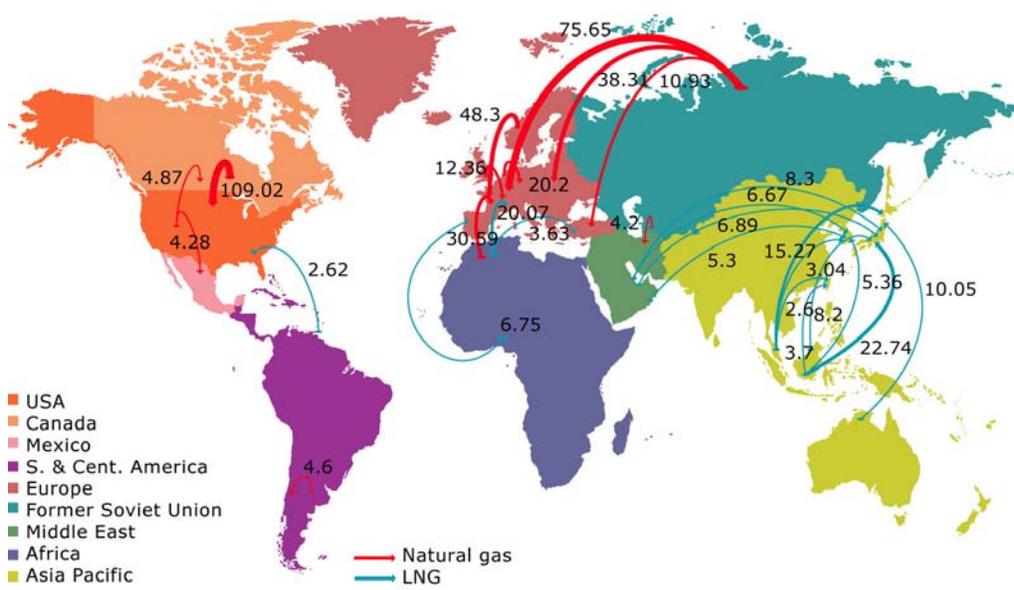
The 2003-2012 PEP assumes that unless new resources are discovered, natural gas imports may be needed to meet the projected demand beyond the 400 MMSCFD production from the Malampaya gasfield. Based on the projected demand, importation could be needed by as early as 2008 with volumes varying from an initial 23 BCF in that year to as much as 194 BCF by 2012 (assuming 4,200 MW of additional capacity for natural gas). To ensure a secure and diverse energy supply, the DOE shall promote the balanced development of LNG importation in parallel with the exploration of indigenous gas resources. On the other hand, subject to the location of facilities designed to utilize natural gas and the availability of needed infrastructure, particularly pipelines, LNG importation could take place even earlier than 2008 and even if total projected demand is within the 400 MMSCFD level.

(a) Potential LNG Sources

The Philippines is situated in the East Asia region where the biggest LNG suppliers and buyers are located. Four economies in this region, namely Australia, Brunei, Indonesia and Malaysia supplied about 50 percent of total world LNG exports in 2001, while three other countries namely, Japan, South Korea and Chinese Taipei accounted for about 71 percent of total world LNG imports.¹¹ The Philippines could potentially draw LNG supplies from a number of countries where excess LNG capacity is projected. Because of its strategic location, the country’s most likely sources of LNG are its South East Asian neighbours particularly, Brunei, Indonesia, Malaysia and Australia (Figure 4).

map of major gas trade movements

Trade flows worldwide (billion cubic metres)



bp statistical review of world energy 2002

Figure 4. The Philippines is along the route of LNG trade in East Asia.

¹¹ BP Global Statistical Review of World Energy, June 2002 (Original source of data: Cedigaz)

(b) Piped Gas Imports through the Trans-Asean Gas Pipeline (TAGP)

As a long-term prospect for gas supply, the DOE is also considering the possibility of importing gas via a pipeline interconnection to the recently launched TAGP (Figure 5). The TAGP is seen to be realized not as one major project involving all ASEAN economies, but will gradually evolve through the construction of cross-border pipelines, with the regional network eventually being established by linking the existing and planned cross-border pipelines by the private sector. Two cross-border pipelines totaling 1,379 km. currently exist between Malaysia and Singapore and between Myanmar and Thailand. More cross-border pipelines are either under construction or are being planned.¹² By 2005, five of the six Southeast Asian economies will be interconnected by cross-border pipelines, namely Malaysia-Singapore, Myanmar-Thailand, Indonesia-Singapore and Thailand-Malaysia, with a total cross-border pipeline length of about 3,000 kilometers. At such time, gas pipelines spanning Southeast Asia are projected to be about 13,000 km., with total trans-border gas transportation capacity of 260 million cubic meters per day (MMCMD).

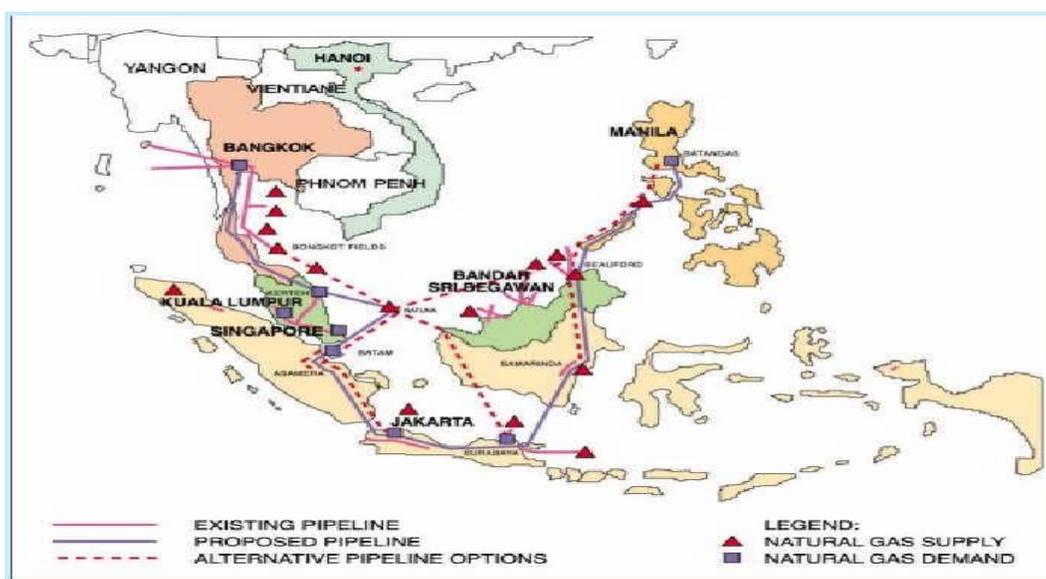


Figure 5. The Trans-ASEAN Gas Pipeline could be a long-term source for imported natural gas for the Philippines.

¹² APERC. 2000. *Natural Gas Pipeline Development in Southeast Asia*. Tokyo: APERC

For the Philippines, the 504-km. offshore pipeline from the Malampaya gasfield can provide a strategic link to the TAGP, the immediate prospects being a connection with Sabah where producers have recently confirmed and are reportedly looking for a market for 4-6 TCF of gas reserves. Beyond the TAGP, other possibilities include a possible scenario for piped gas imports into the Philippines via cross-border pipelines wherein the Philippines would serve as a transit point for gas pipeline deliveries from Southeast Asia through the Philippines to northern destinations such as Fujian province in Mainland China and Taiwan.

The larger volume may enable gas to be landed in the Philippines at a much lower cost. However, a more rigorous transportation analysis is needed to ascertain whether gas transportation from Southeast Asia to Fujian or Taiwan is economically viable via pipeline or whether LNG transport poses a more competitive alternative.

C. Infrastructure Requirements

Given the prominence that natural gas will have within the coming years, it is critical that the proper downstream infrastructure is established. Based on existing demand and supply projections, the following integrated backbone infrastructure will be required within the next decade:

- An 80-100 km. high-pressure gas transmission pipeline from Tabangao, Batangas to Metro Manila (BatMan 1)
- A 130-150 km. high pressure gas transmission pipeline from Bataan peninsula to Metro Manila (BatMan 2)
- A 40-km. undersea high pressure gas transmission pipeline from Bataan peninsula to Metro Manila or Cavite province via Manila Bay (BatCave)

- Assorted gas spur lines to additional customers such as a 35-km. high pressure gas transmission pipeline from Sucat to Pililla, Rizal Province for the Malaya Thermal Power Plant
- A 40-km. city gas pipeline along EDSA which closes the loop of the existing Manila Gas Company pipeline
- Construction of LNG terminals in the Bataan Peninsula or Batangas province
- Construction of a network of gas refilling stations for NGVs in the National Capital Region (NCR)

These enumerated projects are proposed for the island of Luzon where demand concentration for natural gas is projected to be the highest within the PEP planning period. By reasons of topography, population density and access to markets, the most likely initial configuration of the transmission system in Luzon is a trunk pipeline running from the Malampaya gas delivery point in Tabangao, Batangas to the southern part of the NCR. From Metro Manila, there could be branch lines extending westwards through Cavite and/or skirting the east of Metro Manila as far north as Bulacan. Other possible extensions could run across the northern perimeter of Manila Bay or offshore from Tabangao to Cavite province to bypass the onshore route should land access pose a problem (Figure 6).

In the case of the LNG infrastructure, an LNG receiving facility in Bataan could be anchored on a greenfield development in the area or the existing Limay power plants which are potential candidates for conversion from single-cycle to combined-cycle gas turbine power plants. These power plants could fill the need for additional gas-fired generation capacity by 2008. Some of the LNG supply could also be transported through a pipeline from Bataan to Manila to supply industrial customers along the pipeline route or possibly through a branch line to the Subic and Clark economic zones or even the former Bataan Nuclear Power Plant Complex if the plant is converted to natural gas.

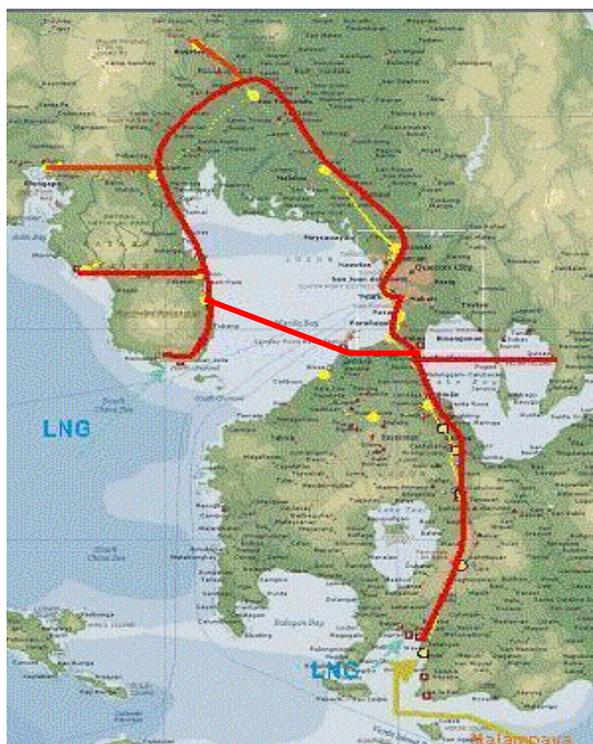


Figure 6. The identified critical pipeline infrastructure to expand the use of natural gas namely, the Batangas-Manila Pipeline (BatMan 1) and the Bataan-Manila Pipeline (BatMan 2) and a possible undersea Batangas-Cavite Pipeline (BatCave).

Alternatively, a 40-km. undersea high pressure gas transmission pipeline could transport LNG from the Bataan peninsula to Metro Manila or Cavite province via Manila Bay. An LNG terminal could also be put up in the Batangas area to strengthen security of supply. More specifically, an LNG terminal in Batangas could possibly serve the following purposes – provide the gas requirement of demand centers that are far from BatMan1, supply additional gas requirement during peak periods which are beyond the capacity limit of the Malampaya pipeline or provide natural gas if and when Malampaya is not able to deliver the needed capacity.

Beyond Luzon, additional demand for natural gas will come from Visayas and Mindanao. The BatMan 1 pipeline could extend a spur line going down the southern part of Luzon passing through the Visayas before touching land at Mindanao. This leg could complete the country's national pipeline network which will allow for the eventual transport of gas to any point in the country. Initial estimates of demand, however, indicate that the required volume of gas to justify this southern leg of the country's pipeline network may not be available until 2015-2020.

IV. STRATEGIES

The formulation of clear, concise and effective strategies is a prerequisite to achieving the stated objectives for the downstream natural gas industry. Within the context of these objectives and the larger policy framework that has been established, the DOE has formulated certain strategies that will allow for a focused development of the industry.

A. Lower the Cost of Natural Gas

Energy self-sufficiency remains a core policy of the government for the sector in the face of the country's continued reliance on imported oil and coal. However, this policy should be balanced with the need to provide more affordable energy and power to end-users. This equation may be further constrained by the need to promote cleaner fuels which usually command a premium in costs.

Given these overriding considerations, the government shall pursue a set of strategies that would rationally address these concerns and achieve a lower gas price at the same time. One of the ways that government can reduce gas prices is for it to reduce its share in the royalties charged under gas exploration and production contracts. This should have the effect of reducing the price of natural gas and encourage increased exploration and production levels. Towards this end, pursuant to Section 35 of EPIRA, E.O. 100 was promulgated by President Macapagal-Arroyo last May 03, 2002 to determine the parameters for this royalty-reduction scheme. The implementing guidelines of this E.O. are expected to be completed soon.

Another strategy that can be pursued is for the government to revisit import tariffs, excise taxes and VAT on imported LNG with a view to encouraging lower LNG prices. The DOE will review this strategy with appropriate government agencies in order to ensure that imported LNG will be in a position to enhance the country's energy supply diversification program and emission reduction initiatives.

Finally, the DOE will minimize procedural and documentary requirements in the processing of service contracts and pipeline permits and actively assist investors in both the upstream and downstream sectors in removing the causes of delay with respect to their particular projects.

B. Stimulate Demand

As natural gas prices become more affordable, it will be easier for government to stimulate demand for this resource in both power and non-power applications.

As earlier stated, the power sector will be the major bulk user of natural gas during the 2003-2012 planning period. It is in this regard that gas-fired power generation, be it greenfield or brownfield development involving the conversion of retired and aging thermal power plants, will be encouraged.

The country is uniquely positioned to stimulate gas demand for power generation in view of the on-going privatization of NPC assets. These assets include thermal power plants which are still active in the generation line up, aging plants or even retired facilities which can be converted to natural gas.

With respect to the other sectors such as the industrial, transport and commercial sectors, a shift to natural gas will also be encouraged to take advantage of its clean burning property, low emission and higher efficiency of conversion. The use of CNG as an alternative fuel for public utility vehicles will be aggressively pushed. Towards this end, the BOI of the DTI has provided fiscal incentives for the use of CNG. Cogeneration in buildings, commercial centers and even in energy-intensive industries shall likewise be encouraged.

C. Increase Supply of Natural Gas and Facilities for Conversion

To sustain the anticipated demand for natural gas, a critical infrastructure system in the form of transmission, distribution and city gas pipelines, LNG terminals, CNG refilling stations and other related and ancillary facilities will need to be established within the next five years.

The government will likewise need to promote upstream exploration and development to tap the significant gas reserves that abound within the country's 16 petroleum basins. To do this, the current service contract regime will be revisited to attract more foreign capital. In addition, the government shall encourage the importation of gas to fill the gap that cannot be supplied by domestic gas. Among the initiatives that will be instituted to accomplish this are (i) liberalization of imports; (ii) lowering of tariffs and excise taxes; and (iii) pursuing the TAGP project.

For the transport sector, the government shall include NGV engines conversion kits for vehicles such as CNG cylinders, regulators, mixers and fuel-air ratio control device in the ASEAN Industrial Cooperation (AICO) program to attract investments in the manufacture of these equipment.

D. Provide a Relevant and Responsive Regulatory Regime

Finally, given the present state of the downstream industry and the potential for selected players to dominate the market, the government must provide for a relevant and responsive pricing and non-price regulatory regime that will prevent monopolistic behavior in the transport of natural gas without stifling fair commercial returns to investors. As regards non-price regulation, the DOE should ensure that its permitting authority will not prove to be a barrier to the entry of players who wish to set up natural gas facilities and infrastructure in the country.

In view of such considerations, the DOE shall implement rules and regulations appropriate to the industry's present stage of development which allow for vertical integration to enable investors to secure their respective anchor loads and guarantee the stability and security of gas supply. Moreover, these regulations should provide incentives for efficiency and facilitate the creation of a competitive gas market where prices are market driven.

While allowing for the prudent recovery of reasonable costs and guaranteeing a reasonable return on investments equivalent to other investments with comparable risks, the pricing methodology adopted by the price regulation should encourage efficiency. For instance, instead

of a straightforward return-on-rate base (RORB) pricing formula, the pricing methodology could adopt a mixed RORB and price-capping formula or other internationally accepted methodologies.

There is also a need to implement pro-competitive regulation which will include liberalizing entry into the industry, requiring non-discriminatory Third Party Access (TPA) to transmission and distribution pipelines, prohibiting cartels and punishing abuse of market power and other practices that restrict, distort or prevent competition.

V. THE REGULATORY FRAMEWORK

The current regulatory framework is designed to maximize economic efficiency in the context of the development stage of the Philippine downstream natural gas industry. As such, rules and regulations will therefore be adopted and implemented to achieve the most efficient use of natural gas resources, the lowest achievable production costs, the improvement of products and production techniques while assuring the integrity and security of supply and a reasonable return on investment.

The Philippine natural gas industry is at a very early stage of development. It is characterised by a single supplier of indigenous gas who also owns one of the two existing pipelines from the gathering facilities to the consuming CCGT stations, with non-existent imports and downstream infrastructure. The regulatory framework should therefore serve the twin and equally urgent objectives of attracting investments as well as laying a robust foundation for the development of an efficient and competitive industry. With these considerations, the DOE foresees the regulatory framework to consist of the following key elements:

A. Entry

For the upstream sector, entry shall be through the conclusion of Service Contracts with the National Government for gas exploration and production under the provisions of Presidential Decree No. 87. Existing regulations will be revisited and new rules will be introduced to attract more foreign capital.

For the downstream sector, a liberalized entry shall be encouraged to increase the supply of natural gas and promote competition, subject only to the Constitutional requirement of a congressional franchise for transmission and distribution systems that are intended to be operated as public utilities and the permitting requirement for all transmission and distribution entities, gas suppliers, operators of LNG facilities and other related ancillary facilities.

B. Structure

In order to promote economies of scale and mitigate market and price risks for new investments, cross-ownership between different industry segments shall be allowed. At the same time, in order to promote competition and the entry of new players, structural and functional unbundling and other similar mechanisms shall be adopted, if necessary.

Vertical Integration

Vertical integration shall be allowed together with a mandatory TPA obligation on the part of pipeline operators which shall be subject to deferment on the basis of reasonable justification.

The development of additional reserves, production capacity and transport infrastructure requires huge investments which can be justified by the existence of alliances between upstream and downstream investors. Vertical integration should minimize the risks associated with investments in capital assets involving large sunk-costs such as gas pipeline systems and production wells since a secure market for their products and/or services is provided.

However, there is a danger that vertical integration could retard the expansion of gas markets if other potential suppliers of gas are not granted access to the essential facilities that constitute natural monopolies (i.e., transmission and distribution pipelines and their related facilities). To mitigate this risk, owners of transmission and distribution utilities shall be required to provide TPA to other gas suppliers on a non-discriminatory basis on terms consistent with a TPA Arrangements Code to be developed by the DOE.

Horizontal Competition for Transmission, Distribution and Supply

Competition in gas supply, both for indigenous and imported sources, shall be encouraged to ensure the stability, security and efficiency of supply.

In line with the Constitutional principle of the non-exclusivity of franchises, competition for the construction, installation and operation of transmission, distribution and related

facilities shall be allowed subject only to the permitting requirements of the DOE which includes the requirement to prove that the applicant is financially and technically capable to operate such businesses.

C. Pricing

The nascent stage of the Philippine downstream natural gas industry coupled with the government's objective to encourage a shift to natural gas for environmental and economic efficiency reasons require that price setting for the transportation of natural gas be guided by prudent regulation until such time that a competitive market develops. Thus, even the pricing of access to these facilities needs to be carefully regulated to prevent discrimination and avoid distortions in the cost structure of the industry.

An argument may be made for the price deregulation among large users who are presumed to possess sufficient bargaining strength and of gas supply which is presumed to be a potentially competitive market. However, in an industry with few suppliers and where greenfield investments necessarily have to be incurred to install facilities for the utilization and supply of natural gas, prices for these activities will be regulated until such time that the markets have developed to warrant deregulation.

In view of these considerations, the pricing of natural gas services shall be based on the following principles:

- Rates and charges for transmission, distribution and related services shall be regulated until such time that their markets become competitive. Prices shall be deregulated in markets for products and/or services which the DOE determines to be competitive following an evaluation of their characteristics.
- Rates and charges shall be regulated on the basis of just and reasonable standards which allow for the prudent recovery of costs, a reasonable return on investments and incentives for efficiency.

- Rates and charges for the transmission, distribution and supply of natural gas shall be unbundled.
- Notwithstanding the pricing of natural gas services, the pricing of natural gas itself shall be market driven.

D. Promotion of Competition

Consistent with the objective of attaining economic efficiency, the regulatory framework shall include rules to promote competition and prevent anti-competitive conduct. These rules would include the following points:

- Agreements, decisions and practices of persons or associations of persons to fix prices and/or output shall be prohibited.
- Other practices, conduct or behavior of persons or associations of persons which restrict, prevent or distort competition such as but not limited to predatory pricing and practices; excessive pricing; bundling and other vertical restraints; denial of access to essential facilities on fair terms; and discriminatory conditions on transactions that restrict, prevent or distort competition shall likewise be prohibited.
- Remedies will be imposed in order to restore competition such as but not limited to the re-imposition of price controls where these had been lifted, a requirement for divestment or refund of excess profits, the issuance of injunctions and the imposition of fines and penalties.

E. Institutional Arrangements

The regulation of the downstream natural gas industry shall be the responsibility of the DOE and the Energy Regulatory Commission (ERC). The nascent stage of the industry along with the critical objective of increasing the supply and utilization of natural gas through the promotion of investments requires that the DOE be responsible for non-price regulation. On the other hand,

the industry's close links to the electricity sector and the ERC's experience with price regulation necessitate that the pricing function for natural gas be assumed by the ERC.

F. Review

The development of the natural gas industry depends on a dynamic regulatory framework. The rules must evolve in accordance with the industry's evolution and anticipate future requirements. Accordingly, the regulatory framework shall be reviewed periodically by the DOE in consultation with industry participants with a view to its updating in a manner consistent with the development requirements of the industry at such time.

VI. AGENDA FOR LEGISLATION

An efficient regulatory regime needs to be stable, credible and transparent. It depends, in large part, on well-defined laws that clearly set out the rules, limits the discretionary authority of the regulators and facilitates the resolution of disputes.

Philippine laws and jurisprudence are replete with rules and doctrines that provide the legal and institutional basis and framework for the regulation of the gas industry (see Annex 2). The exercise of the National Government's legitimate power to promulgate rules and regulations is the sole requisite in order to carry out the provisions of the law to effect.¹³ This served as the legal basis for the DOE's issuance of the Interim Rules and Regulations Governing the Transmission, Distribution and Supply of Natural Gas (Interim Gas Rules). The Interim Gas Rules are intended to guide the behavior of the industry, DOE and other government agencies pending the enactment of a law specific to the regulation of the downstream gas industry which addresses certain identified gaps.

It is the existence of these gaps in the existing legal framework and the need to consolidate in a single document the key regulatory principles and rules discussed in Part V of this paper that require the enactment of a new law to guide the coordinated and integrated development of the downstream natural gas industry. The DOE is now working closely with Congress and the industry for the passage of this legislative measure.

¹³ Administrative agencies are vested with the power to promulgate rules and regulations within the ambit of existing laws (Commissioner of Internal Revenue v.s. Court of Appeals, 240 SCRA NO.368)

VII. CONCLUSION

The DOE has been tasked by President Gloria Macapagal-Arroyo through E.O. No. 66 signed on January 18, 2002 to be the lead agency for the development of the country's natural gas industry. To fulfill this mandate and to ensure that the benefits from the industry's development accrue to the Filipino people, the DOE has drawn up this policy and regulatory framework for the development of the Philippine natural gas industry particularly its downstream sector including the promotion of natural gas use in all demand sectors including the power, transport, industry, commercial and residential sectors.

The birth of the country's natural gas industry was marked by the successful launching of the Malampaya Deep-Water Gas to Power Project in October 16, 2001. With an initial production capacity of 400 MMSCFD, the country's first commercial gas discovery from the Malampaya gasfield will supply fuel to 2,760 MW of installed power generation capacity. The development of this and other gas reserves advances the country's goal of a stable and secure energy supply and a cleaner environment while providing additional benefits in the form of added revenues and employment.

Nevertheless, the growth of the gas market will be anchored on the development of a transmission and distribution infrastructure such as pipeline transmission and distribution networks, LNG terminals and refilling stations for NGVs that would enable new gas supplies to be developed and brought to the potential gas markets. Its expansion will be facilitated by focused policy measures that are intended to make the price of natural gas competitive compared to other fuels and to reduce the cost of converting power plants, industrial and commercial establishments and vehicles to natural gas.

This Policy Paper embodies the policies, objectives, programs and strategies of the DOE for developing a natural gas industry in the Philippines in the context of the gas supply and demand prospects and an environment that is conducive to investments, promotes economic efficiency and maximizes consumer welfare. It is also intended to serve as a reference document for the ongoing deliberations in Congress of a proposed legislative measure to govern the development of

the downstream natural gas industry and companion to the DOE Circular entitled “Interim Rules and Regulations Governing the Transmission, Distribution, and Supply of Natural Gas.”

ANNEX 1 MODELS OF GAS INDUSTRY DEVELOPMENT

To set the discussion of the policy and regulatory framework in context, it would be useful to look at observed gas market models through the different stages of development, i.e., the *gas market creation*, the *market development* and the *mature market* stages. The rate at which a gas market in a particular economy moves from one stage to another depends on a host of technical, economic and institutional factors, but having a regulatory framework based on sound economic fundamentals at the outset can facilitate a smooth transition towards a competitive market.

Gas Market Creation Stage. The traditional gas market model is a “vertically-integrated” structure, with one company (in most countries a state-owned company) performing two or more of the industry functions and combines potentially competitive and monopoly activities. This model characterized the gas industries of the US, the UK and Argentina, to name a few, at their early development stage and is still found in many countries including Thailand, France, Hungary and Poland.

An overriding argument for vertical integration is that it avoids the risk that investments in long-lived assets with large sunk costs, such as gas pipelines, will not be recovered if it is locked into one particular use or customer. This is of particular concern in emerging markets where there is only a few or sometimes just one potential customer. On the other hand, it raises concerns that a vertically-integrated enterprise may abuse its market power and charge unreasonably high prices thereby discouraging gas market expansion. Integrated gas utilities are thus usually heavily regulated in order to promote economic efficiency and prevent the exercise of market power.

Gas Market Development Stage. To encourage gas market expansion and “gas-to-gas” competition, the market structure must allow producers the choice to sell gas directly to large customers or suppliers; conversely, it must allow large customers to buy gas directly from suppliers or producers. This can be achieved by providing open and non-discriminatory access to pipelines and related “bottleneck” facilities by third party users. Operators of the pipeline may be allowed to continue its merchant functions, i.e., buy and sell gas, particularly if it still needs to secure gas demand needed to recover its fixed costs. Transport and merchant functions, however, must be run as “arms-length” activities in separate subsidiaries and the transport

subsidiary must apply the same terms, access rules, services and tariffs to the merchant subsidiary as applied to third parties. If the owner of the bottleneck facility tries to exploit market power in the competitive segments, there may be a case for imposing limits on vertical integration and separating ownership from other parts of the system.

The US and the UK pioneered the concept of “open access” into the monopoly pipeline operations in the early 1980s. In the case of the US, this measure was intended to allow large consumers to buy directly from producers and avail of cheaper, deregulated gas following the deregulation of wellhead gas prices. The concept did not prosper until other measures were introduced to deal with the problem of stranded gas held by incumbent pipeline owners in long-term take-or-pay contracts. Open-access was eventually made mandatory coupled with the unbundling of the transport and supply functions.

In the UK, the introduction of open-access to the pipelines of British Gas, then a state-owned monopoly for gas transmission and distribution (which also held significant interests in gas production), did not encourage the entry of competitors until the company was privatized and other measures were introduced to loosen its grip on the market such as the reduction of its monopoly of the customer market and also of its position as monopsony buyer of North Sea gas production.

Other countries which embarked on gas reforms later learned their lessons from the experiences of their predecessors such that Argentina, for example, restructured its state-owned monopoly, Gas del Estado, into two transmission companies and eight distribution companies prior to privatization. An open-access regime was also established and restrictions on cross-ownership between transport and supply functions were imposed i.e. Transmission companies were not allowed to trade in gas. Likewise, gas producers, storage companies, traders and consumers who contract for purchases of gas directly with producers were prohibited from owning a controlling stake in a transmission and distribution company. Distributors were not allowed to hold a controlling stake in a transmission company and vice versa.

The outcomes of efforts to manage competition in these countries are mixed but a general trend towards reduction of costs and prices has been observed as more stringent competition measures were introduced.

Mature Market Stage. When the market reaches a sufficient level of liquidity, that is, abundance in both gas supply and system capacity, there will be more players and market operation becomes more complex. Strict enforcement of unbundling rules ensures that costs are correctly allocated to a gas company's different activities such as gas purchase, transmission, distribution, storage and other flexibility mechanisms. This is a fundamental basis for the pricing of the different services and elements, whether open access is regulated or negotiated, and for non-discriminatory treatment of all players. A stronger form of unbundling, that is, divestiture and ownership separation, as opposed to accounting or functional separation, is argued to eliminate both the incentives and the ability to engage in discriminatory behavior. However, a concern with ownership separation of transmission and sales is that it may lead to inefficient investment decisions and increase the cost of doing business. In fast growing markets, the contracting of large volumes from producers goes hand in hand with the design and construction of the transport system needed to bring the new volumes to the market.

Other advanced schemes of promoting competition that are seen in mature markets such as those of the US, the UK and Argentina are the extension of open access and supply competition to retail markets and secondary trading of transport capacity.

ANNEX 2 Legal Framework

There are distinct regulatory frameworks applicable to the two major components of natural gas industry operations that is, the upstream and downstream sectors. For the upstream sector, the State's Permanent Sovereignty Over its Natural Resources¹⁴ stays as the overarching legal framework. The Petroleum Act of 1949 clarifies that ownership of all natural deposits and of petroleum or natural gas in the Philippines, including its territorial waters, belongs the State. As such, the exploration, development and utilization of natural resources shall be "under the full control and supervision of the State."¹⁵

Generally, the State may undertake such activities directly or in partnership with private persons or corporations, whose capitalization must be at least 60% owned by Filipino Citizens¹⁶. However, the "Constitution allows the President to enter into agreements with foreign-owned corporations involving technical or financial assistance for large scale exploration, development and utilization of petroleum in accordance with the general terms and conditions provided by law, based on real contributions to economic growth and welfare of the country."¹⁷ This serves as the basis for P.D. 87 which grants the DOE the mandate to administer Service Contracts for oil and gas exploration and development.

In the case of the downstream sector, the private sector can construct and operate pipelines in partnership with the government through Concession Agreements as provided in the Petroleum Act of 1949, a Service Contract granted under PD 87 or by a franchise from Congress for entities engaged in public utility operations. These main authorizations are the pre-requisites for the granting of a permit by the DOE prior to commencement of construction and operation.

¹⁴ The State's sovereignty over its natural resources is a principle enshrined in the Constitution which dates back to Spanish Crown's declaration that all natural resources belongs to the Queen, otherwise known as the Regalian Doctrine. In International Environmental Law, the technical term "State's Permanent Sovereignty Over its Natural Resources" was adopted in the Rio Declaration of 1992. It mainly recognizes that while environmental problems are of global concern and ergo, governed by international treaties, the determination of how to use the natural resources of a State to achieve sustainable development still lies upon the sovereign state.

¹⁵ Article XII, Sec.2 of the Philippine Constitution

¹⁶ Ibid.

¹⁷ Ibid.

The DOE seeks to operationalize the existing framework for the downstream sector by implementing the Interim Gas Rules. These Rules aim to clarify and implement regulatory policies of the DOE. For instance, some doctrines that are intended only to apply to the upstream segment such as the exploration, development and production seems to overlap into the downstream operations such as the transmission and distribution operations.

At present, there is no single law dealing with the regulation of the downstream segment of natural gas. What exists are numerous laws, issuances and directives that govern the petroleum industry as a whole. Thus, the DOE has drawn the regulatory mechanisms embodied in the Interim Gas Rules from the following related statutes:

- E.O. No. 66 (Designating the Department of Energy as the lead Agency in Developing the Philippine Natural Gas Industry) which authorizes the DOE to call other government agencies for assistance to ensure the development of the Natural Gas Industry.
- R.A No. 7638 (Department of Energy Act of 1992) which grants to DOE its non-price regulatory jurisdiction, powers and functions.
- R.A. No. 9136 (the Electric Power Industry Reform Act of 2001) which sets the general guidelines for pricing and tariff regulations. Further, it establishes the mechanisms to encourage competition such as cross-ownership, anti-competitive practices and the prevention of market abuse. This Act also created the ERC.
- E.O. No. 172 (creating the Energy Regulatory Board, as amended by R. A. 9136) which consolidates the regulatory and adjudicatory functions in the energy sector to the ERB such as fixing and regulation of prices of petroleum products, rate and schedule or prices of piped gas and rates of the pipeline concessionaires.
- P.D. No. 87 (The Oil Exploration and Development Act of 1972), which introduces the regulations that govern the service contracts as a means whereby private participants can undertake petroleum operations in partnership with the government.

- R. A. No. 8479 (Downstream Oil Industry Deregulation Act of 1998) which establishes the rules on competition in order to ensure a free market under a regime of fair prices and ensuring adequate supply of petroleum products to encourage new players in the industry.
- Commonwealth Act No. 146 (The Public Service Law) which governs the grant of franchises and permits for the operation of business imbued with public interest and the imposition of penalties for violation of permits and other issuances.
- R. A. No. 387 (Petroleum Act of 1949), which deals with the regulation of concessions and concessionaires for exploration, development, reproduction, refining and pipelines for petroleum including natural gas.
- Department Circular No. 95-06-006 (Policy Guidelines on the Overall Development and Utilization of Natural Gas in the Philippines).