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資料－1 質問票及び回答

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED		Plan Organization :	Department of Energy
PROJECT NAME:		QUESTIONNAIRE/ INFORMATION REQUIRED		Ref. No. :	QIR-JICA/DOE-001
Viability Study on Natural Gas Industry Development		QUESTIONNAIRE/ INFORMATION REQUIRED		Issue Date :	Jan. 14, 2000
QUESTIONNAIRE/ INFORMATION REQUIRED		QUESTIONNAIRE/ INFORMATION REQUIRED		Revision Date :	Feb. 28, 2000

No.	Questionnaire/Information Required	Reply	Remarks
1.	<p>Energy Forecast Although we have already received the report "Philippine Energy Plan 1999-2008," we would like to discuss other projections including those forecasts carried out by private sector entities such as oil companies and research institutes.</p>	<p>The data could be gathered during the meetings with the different companies.</p>	
2.	<p>Energy Statistics Time-series data on energy consumption by energy type and by sector for the past consecutive ten years (five years at the least). 2.1 Data should be presented in terms of the following energy categories: (1) Coal (2) Oil products—gasoline, gas oil, kerosene, fuel oil, LPG (3) Natural gas (4) Electricity (5) Others 2.2 They should also be breakdowns of the following sectors: (1) Power sector i.e., the energy conversion sector (2) Industrial sector and sub-sector (ISEC* two-digit level) (3) Household sector (4) Commercial sector (5) Transportation sector (6) Others including the agriculture sector */ International Standards for Industrial Classification</p>	<p>The data available at the Department are already in the Philippine Energy Plan provided to the Study Team during last year's visit.</p> <p>2.1/2.2 JICA received the following breakdown data ; 1) Petroleum consumption by industry (1994-1998) 2) Total sales to industrial customers (1990-1998) 3) 1999 Electric Energy Consumption (Philippines, Luzon, Visayas and Mindanao) 4) Historical Demand by Region (1991-1999) 5) Summary Demand by Region (1991-1999)</p>	

<p>3 .</p> <p>Energy Prices Time-series data on energy prices, as follows:</p> <ol style="list-style-type: none"> (1) Coal (2) Oil products---gasoline, gas oil, kerosene, fuel oil, LPG (3) Natural gas (4) Electricity (5) Others 	<p>The time series energy prices data may be available with the Energy Regulatory Board.</p> <p>JICA received the following data;</p> <ol style="list-style-type: none"> (1) Average Coal Prices in the Philippines 1946-1999 (2) Petroleum Product Prices (1992-1999) (3) Historical Crude Import Prices 1987-1996 (4) Currency Change between Peso and US\$ 1975-1997 	
<p>4 .</p> <p>Previous Markets Study</p> <ol style="list-style-type: none"> (1) For Residential <ul style="list-style-type: none"> - Previous study (if any) on fuel conversion from oil products to natural gas (2) For Commercial <ul style="list-style-type: none"> - Previous study (if any) on fuel conversion from oil products to natural gas (3) For Electric Power Generation <ul style="list-style-type: none"> - Previous study (if any) on fuel conversion in existing power plants from oil products to natural gas (4) For Industry <ul style="list-style-type: none"> - Previous study (if any) on fuel conversion in existing industrial plants from oil products to natural gas - Fields of existing industrial plants which utilize oil products as fuel - Future development plan in industrial fields (5) Transport <ul style="list-style-type: none"> - Previous study (if any) on mass transportation system other than vehicles (6) Chemical Feedstock <ul style="list-style-type: none"> - Outline of refinery, petrochemical and chemical industries in Philippines - Previous studies (if any) for developing chemical industry based on natural gas (7) New Markets <ul style="list-style-type: none"> - Opinions on new natural gas markets, such as co-generation power plant, gas refrigeration system, fuel cell vehicles, gas to liquid and so on 	<p>The residential data can be found in the Household Energy Consumption Survey of the DOE, PNOC-EC may be able to provide the team with the data for the industrial sector, while the data on electric power generation can be acquired from NPC.</p> <p>The transportation sector study may be available through the Department of Transportation and Communication or operators of the LRT and the MRT.</p> <p>The chemical feedstock study can be consulted with the oil companies i.e. Shell, Petron and Caltex, however there are no Commercial data and new market available.</p> <p>JICA received the "Household Energy Consumption Survey Report."</p> <p>Natural Gas for Transport Project Report will be provided later by DOE.</p>	

<p>5.</p>	<p>Industrial Zone Development</p> <p>(1) Map of the Batangas - Manila- Bataan pipeline route, which shows: - Zoning or area classification into industrial, commercial, residential, and any other ones helpful for planning purpose - Major roads, rivers, etc.</p> <p>(2) Map of the Cagayann de Oro – Iligan pipeline route, which shows: - Zoning or area classification into industrial, commercial, residential, and any other ones helpful for planning purpose - Major roads, rivers, etc.</p> <p>(3) Map of the Davao pipeline route, which shows: - Zoning or area classification into industrial, commercial, residential, and any other ones helpful for planning purpose - Major roads, rivers, etc.</p>	<p>There are still no established route for the pipeline network for Cagayan de Oro-Iligan and Davao, however, several options are being looked at by the ADB study, Shell and FGHC for the Batangas – Manila Bataan route.</p>	
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<p>6.</p>	<p>Laws and Regulations on the Onshore/Offshore Gas Pipeline Systems</p> <p>6.1 Current laws and regulations</p> <p>(1) The system of the laws and the regulations are outlined and it shows by flow-chart</p> <p>(2) It outlines how a various technical standards are incorporated into the laws and the regulations</p> <p>(3) Copies of relevant laws, regulations, codes and standards dealing with design, operation and maintenance of onshore/offshore gas pipeline systems which is consisting of meter facilities, gas compression facilities, pumps, and associated piping and appurtenances, etc.</p> <p>1) Laws and regulations will be included the following points of view;</p> <ul style="list-style-type: none"> • Control body • Basic law • Land acquisition • Health, Safety and Environment • Harbor • Fishing <p>2) Code and Standards will be included the following points of view;</p> <ul style="list-style-type: none"> • Design • Materials and dimensions • Safety systems • Construction and welding • Inspection and testing • Operation and maintenance • Corrosion control <p>6.2 The trend of the laws/regulations/codes/standards revision in future</p>	<p>6.1 Currently, there are no laws and regulations of onshore/offshore pipeline systems.</p> <p>The ADB study has proposed an Implementing Rules and Regulations for Establishing Natural Gas Pipeline Networks. The ADB and the PNOC-EC studies also provide some data on the prospects for natural gas substitution.</p> <p>The expected completion of ADB study will be more than one month later.</p> <p>JICA received a complete set of ADB study (Draft Final Report).</p> <p>6.2 DOE hopefully intends to issue the laws/regulations/codes/standards within 2000.</p>	
<p>7.</p>	<p>The Permission and the Approval Procedure on the Onshore/Offshore Gas Pipeline Systems</p> <p>7.1 Current permission and approval</p> <p>(1) Flow and the outline of the permission and approval</p> <p>(2) Approval organization</p> <p>(3) Permission and the approval procedure of pipeline construction and operation.</p> <p>7.2 The trend of the permission and the approval procedure revision in future</p>	<p>7.1 There is no Approval Procedure on the onshore/offshore pipeline system.</p> <p>The DOE through the EIAB issues the Pipeline Permit while the pipeline franchise shall be issued by congress.</p> <p>7.2 DOE is still in the processing of establishing Approval Procedure, however, DOE was already issue the approval to First Gas Pipeline Corporation. for Tabangao-Santa Rita fuel gas pipeline.</p>	

8.	<p>Safety and Environmental Protection</p> <p>8.1 Copies of Philippines' s code/standards and regulations for safety and environmental protection</p> <p>8.2 Hazard prevention measures including considerations for earthquake:</p> <p>(1) Seismic measurement system and instruments</p> <p>(2) Gas leak detection system</p> <p>(3) Emergency shutdown system and allocation of shutdown valves</p>	<p>First Gas Pipeline Corporation is already received the Environmental Compliance Certification by the Department of Environment for Natural Resource.</p>	
9.	<p>Pipeline Network Installation</p> <p>(1) Requirements for common-duct/tunnel type installation, if any</p>	<p>No requirement for common-duct/tunnel type installation.</p>	
10.	<p>Local Consultant</p> <p>(1) Candidate of local consultant list and capability</p>	<p>No list provided.</p>	
11.	<p>Natural Gas Resource (Addition by DOE.)</p>	<p>The total natural gas resource of the country is available with the DOE through ERDB</p> <p>JICA received the map of natural gas resources by each field.</p>	
12.	<p>Power Development Program, Use of Natural Gas in the Power Sector (Addition by DOE)</p>	<p>The 1999 PDP of NPC is already available but there is still no study regarding LNG importation.</p>	
13.	<p>Feasibility Study of Trans-ASEAN Pipeline (Addition by DOE)</p>	<p>No update yet.</p> <p>JICA received " Master Plan on Natural Gas Development and Utilization in ASEAN, August 1995, ASEAN – EC Energy Management Training and Research Centre"</p>	
14.	<p>Structure of Customers (Addition by DOE)</p>	<p>Data can be gathered during meeting with Petron, Caltex and Shell.</p>	
15.	<p>Gas Processing Facilities, Distribution Pipeline Network, Operation and Maintenance and Pipeline Network Installation (Addition by DOE)</p>	<p>No facilities /pipeline yet. SPEX and FGHC may have some data available.</p>	

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED		Energy Regulatory Board
PROJECT NAME: Viability Study on Natural Gas Industry Development		Plan Organization :	QIR-JICA/ERB-001	
		Ref. No. :	Feb. 11, 2000	
		Issue Date :		
		Revision Date :		

No.	Questionnaire/Information Required	Reply	Remarks
1.	<p>Regulatory Framework To conduct a potential markets study for six fields in Philippines, such as Residential, Commercial, Electric Power Generation, Industry, Transport, Chemical Feedstock and New Markets; (1) Extents of required regulatory frameworks and key items to be considered (2) List of the names of organization to involved and their individual roles (3) List of relevant regulations including juridical delegation to the Energy Regulatory Board (ERB) (4) A copy of "DOE Circular No.95-06-006" and "Downstream Oil Industry Deregulation Act of 1998"</p> <p>Energy Prices and Tariffs Time-series data on energy prices and tariffs on the final consumer level. 2.1 Energy categories are: (1) Coal (2) Oil products—gasoline, gas oil, kerosene, fuel oil, LPG (3) Natural gas (4) Electricity (5) Others 2.2 Consumer categories are: (1) Industrial sector (2) Household sector (3) Commercial sector (4) Power sector (5) Other sectors</p>	<p>The regulatory framework for natural gas is now under discussion stage through reviewing the report prepared by ADB. The discussion result will be made by the end of 2000. DOE is taking a lead in this study.</p> <p>ERB did not have the data regarding natural gas. However, the following information were collected. 1) ERB Primer, Energy Regulatory Board 2) National Power Corporation, Average Rates per Customer Class, 1995-1999 3) Summary of Average Rates (of Electric Cooperatives), 1996-1998 4) ERB Presentation Materials (Hardcopy of Transparencies) 5) Energy Regulatory Board, "How Does ERB Determine Just And Reasonable Rates?" 6) Executive Order No.172, Creating The Energy Regulatory Board 7) Republic Act No. 8479, An Act Deregulating The Downstream Oil Industry, And For Other Purposes.</p>	<p>ERB was not a right organization to discuss the matter of natural gas. EIAB is an organization for the purpose.</p>
2.			

3	Regulation of Energy Prices and Tariffs We would like to discuss the current regulations regarding energy pricing and policies for price regulation.	ERB takes care of the price and tariffs only for electricity and is not in a position to discuss the matter of natural gas.	
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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED		National Power Corporation
PROJECT NAME: Viability Study on Natural Gas Industry Development		Plan Organization :	QIR-JICA/NPC-001	
		Issue Date :	Feb. 10, 2000	
		Revision Date :		

No.	Questionnaire/Information Required	Reply	Remarks
1.	<p>Power Development Program</p> <p>(1) The Philippines's power development plan and receive the latest NPC Power Development Program, i.e., the 1999 version if available.</p> <p>(2) Map showing route and transmission capacity of existing and under-planning power transmission line in Mindanao, Luzon and Visayas</p> <p>(3) Map showing location and generation capacity of existing and under-planning power plant in Mindanao, Luzon and Visayas</p>	<p>Received the following data;</p> <p>(1) Operational Highlight</p> <p>(2) Financial Highlight</p> <p>(3) Grid Map</p> <p>(4) 1999 NPC Power Development Program</p>	The (4) & (3) in left column is useful for reviewing work.
2.	<p>Use of Natural Gas in the Power Sector</p> <p>The prospects for the use of natural gas including domestically produced gas, imported LNG, and the Trans-ASEAN gas pipeline project.</p>	No study were done by NPC.	

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED		Plan Organization : Philippine National Oil Company E.C.
PROJECT NAME: Viability Study on Natural Gas Industry Development				Ref. No. : QIR-JICA/PNOCEC-001
				Issue Date : Feb. 16, 2000
				Revision Date :

No.	Questionnaire/Information Required	Reply	Remarks
1	<p>Natural Gas Resource</p> <p>1.1 Prospects of the PNOC-EC for natural gas development in the future</p> <p>1.2 Market development to facilitate natural gas use in the industrial and household/commercial sectors.</p>	<p>Received the following information.</p> <p>(1)Presentation for Natural Gas Development</p> <p>(2)Projected Gas Demand for NCR and South Luzon</p> <p>Heard the progress of development for SC38, GSEC84, GSEC84, GSEC73, GSEC88, GSEC76 and others.</p>	
2	<p>Feasibility Study of Trans-ASEAN Pipeline</p> <p>2.1 Update information of Feasibility Study</p> <p>The Feasibility Study will be finalized within the year of 2001 by last mission dated Sep. 27, 1999.</p>	<p>PNOC-EC had a feeling that Trans-Asean Gas Pipeline may be feasible for the substitution of LPG and Gas Oil.</p>	

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED	
PROJECT NAME: Viability Study on Natural Gas Industry Development		Plan Organization : Manila Gas Corporation	Ref. No. : QIR-JICA/MGC-001
		Issue Date : Jan. 14, 2000	Revision Date : Feb. 28, 2000

No.	Questionnaire/Information Required	Reply	Remarks
1.	<p>Structure of Customers The structure of your customers with the following data and prospects for the natural gas substitution for LPG.</p> <p>(1) Time-series data on LPG consumption and tariffs by customer category for the past consecutive ten years (five years at the least)</p>	<p>Sales average per year for past 5 years as follows; (1) Dealer: 42,000 Metric Tons (2) Domestic users: 5,800 Metric Tons (3) Commercial users (200 customers): 4,000 Metric Tons</p>	
2.	<p>Gas Processing Facilities (1) Pressure regulating facilities at the points where receives the source gas Location, capacity, type, process, auxiliaries, and future plans for expansion</p>	<p>JICA received the Drawing of Plan Layout of Manila Gas Main Distribution Lines. Regulator: Fisher Type 66 -13 pcs.</p>	
3.	<p>Distribution Pipeline Network (1) Overall process schematic of the gas distribution system (2) Design data and operating condition</p>	<p>(1) Process Schematic Flow is not available. (2) Low Pressure: 410 km, 400 mm Aq. High Pressure: 25 km, 0.07-1.4 kg/cm²</p>	
4.	<p>Operation and Maintenance (1) Operation standard and practices (2) Computerized operation support system linked to the SCADA system, if any (3) Maintenance standard and practices (4) Statistical data of leak and blockage occurrence</p>	<p>Status of leakage and clogging; High pressure leakage 6" - 0.04 pts/km Low pressure leakage 3" and below-0.19 pts/km 4" and over-0.18 pts/km Low pressure clogging 3" and below-0.26 pts/km 4" and over-0.30 pts/km Transport capacity: Peak during the 1960's with a volume of 20 Million cubic meter per year.</p>	
5.	<p>Pipeline Network Installation (1) Requirements for common-duct/tunnel type installation, if any</p>	<p>No requirement for common-duct/tunnel type installation.</p>	

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED		Plan Organization :	Department of Finance
PROJECT NAME: Viability Study on Natural Gas Industry Development				Ref. No. :	QIR-JICA/DOT-001
				Issue Date :	Jan. 14, 2000
				Revision Date :	

No.	Questionnaire/Information Required	Reply	Remarks
1.	<p>Macroeconomic Data Time-series macroeconomic data for the past consecutive ten years, as follows: (1) Data on GDP growth by sector, e.g., industry, manufacturing, services, and agriculture. (2) Data on household income (3) Prospects for GDP growth in both the short run and the long run.</p>	Request for interview was suspended.	Meeting was not hold.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED	
PROJECT NAME: Viability Study on Natural Gas Industry Development		Plan Organization :	Department of Trade and Industry
		Ref. No. :	QIR-JICA/DOIT-001
		Issue Date :	Jan. 14, 2000
		Revision Date :	

No.	Questionnaire/Information Required	Reply	Remarks
1.	<p>Industrial Statistics Time-series data on industrial output by subsector (ISEC* two-digit level) for the past consecutive ten years (five years at the least) with breakdowns by the following areas: (1) Batabgas-Mamila-Bataan area in Luzon (2) Cagayan de Oro Corridor in Mindanao (3) Davao area in Mindanao</p> <p>* / International Standards for Industrial Classification</p>	Not available.	These Data may not exist.
2.	<p>Industrial Zone Development (1) Map of the Batangas - Mamila- Bataan pipeline route, which shows: - Zoning or area classification into industrial, commercial, residential, and any other ones helpful for planning purpose - Major roads, rivers, etc. (2) Map of the Cagayann de Oro - Iligan pipeline route, which shows: - Zoning or area classification into industrial, commercial, residential, and any other ones helpful for planning purpose - Major roads, rivers, etc. (3) Map of the Davao pipeline route, which shows: - Zoning or area classification into industrial, commercial, residential, and any other ones helpful for planning purpose - Major roads, rivers, etc.</p>	Not available.	Only those data classified by region and industrial subsector were available. (However, they were not useful.)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED		First Gas Holdings Corporation	
PROJECT NAME: Viability Study on Natural Gas Industry Development				Plan Organization : QIR-JICA/FGH-001	
				Ref. No. : Jan. 14, 2000	
				Issue Date :	
				Revision Date :	

No.	Questionnaire/Information Required	Reply	Remarks
1.	Batangas- Manila Pipeline (1) Design data and operating conditions of the Batangas-Manila trunk line (if any). (2) Map(s) showing the route of the trunk line with major industrial consumers.	We received only verbal reply.	Numerical data were not available.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED		National Economic Development Authority
PROJECT NAME: Viability Study on Natural Gas Industry Development		Plan Organization :	QIR-JICA/NEDA-001	
		Issue Date :	Jan. 14, 2000	
		Revision Date :		

No.	Questionnaire/Information Required	Reply	Remarks
1.	<p>Macroeconomic Data Time-series macroeconomic data for the past consecutive ten years, as follows: (1) Data on GDP growth by sector, e.g., industry, manufacturing, services, and agriculture. (2) Data on household income (3) Prospects for GDP growth in both the short run and the long run.</p> <p>Industrial Zone Development (1) Map of the Batangas - Manila- Bataan pipeline route, which shows: - Zoning or area classification into industrial, commercial, residential, and any other ones helpful for planning purpose - Major roads, rivers, etc. (2) Map of the Cagayann de Oro - Iligan pipeline route, which shows: - Zoning or area classification into industrial, commercial, residential, and any other ones helpful for planning purpose - Major roads, rivers, etc. (3) Map of the Davao pipeline route, which shows: - Zoning or area classification into industrial, commercial, residential, and any other ones helpful for planning purpose - Major roads, rivers, etc.</p>	<p>Available data were only those in the NEDA web. Latest GDP data could be down loaded from the web.</p> <p>No reply.</p>	<p>Detail data were not available.</p> <p>Nothing available.</p>
2.			

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED		Oil Companies
PROJECT NAME: Viability Study on Natural Gas Industry Development		Plan Organization :	QIR-JICA/OC-001	
		Issue Date :	Jan. 14, 2000	
		Revision Date :		

No.	Questionnaire/Information Required	Reply	Remarks
1.	<p>Prospects for the natural gas substitution The structure of the demand for oil products and prospects for the natural gas substitution for existing oil markets, e.g., heavy fuel oil and diesel fuel for power generation (of both utilities and auto-producers), heavy fuel for industrial use and L.P.G for household use.</p>	<p>Caltex canceled the scheduled interview due to unexpected accident of the person in charge Data were not available in Petron.</p>	<p>We collected time-series data on oil product consumption from the DOE.</p>
2.	<p>Natural Gas Resource 2.1 Update information of status of Malampaya natural gas project Target of landing gas for power plant commissioning by Oct. 1,2001 and full sales delivery on Jan. 1,2002. 2.2 Any natural gas development in future other than Malampaya gas field.</p>	<p>Information was not available in Petron</p>	

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE/ INFORMATION REQUIRED		Plan Organization : Meralco
PROJECT NAME: Viability Study on Natural Gas Industry Development				Ref. No. : QIR-JICA/MRC-001
				Issue Date : Jan. 14, 2000
				Revision Date :

No.	Questionnaire/Information Required	Reply	Remarks
1.	<p>Power Development Plan Meralco's plan for power development including power purchase from independent power producers (IPPs), and the use of natural gas.</p>	<p>We collected the following data:</p> <ul style="list-style-type: none"> · Number of Meralco customers, kW, kWh · Meralco's prospect for power demand · Meralco power development plan 	<p>In addition, we received the 1998 annual report.</p>

資料－2 収集資料リスト

資料収集リスト

番号	資料の名称	発行日	形態 (図書・地図等)	収集資料	専門家 作成資料	JICA 作成資料	テキスト	発行機関	取次区分	図書館記 入欄
1.	Reply on JICA Questionnaire	2000/2/4	コピー	○				PNOC-EC	JR・CR()・SR	
2.	Comments on the JICA Questionnaire	2000/2/4	コピー	○				DOE	JR・CR()・SR	
3.	Scope of Operations, Tributary Area, Bulk Plant Layout		コピー	○				Petron Davao Plant	JR・CR()・SR	
4.	Invest in Davao		図書	○				Davao City Information Center	JR・CR()・SR	
5.	Mindanao in Southern Philippines (Including Strategic Framework Plan)		図書	○				DTI-XI	JR・CR()・SR	
6.	Davao Integrated Development Program		図書	○				DIDP Project Management Office	JR・CR()・SR	
7.	Energy Consumption of Provinces/Cities of Mindanao in Kilo-Watt-Hours, 1997-1998		コピー	○				DOE-Mindanao Filed Office	JR・CR()・SR	
8.	Mindanao Electric Generating Plants, As of December 1999		コピー	○				DOE-Mindanao Filed Office	JR・CR()・SR	
9.	Mindanao Grid Main Power Plants		コピー	○				DOE-Mindanao Filed Office	JR・CR()・SR	
10.	Natural Gas Development Program	1999/12	コピー	○				PNOC-EC	JR・CR()・SR	
11.	First Philippine Industrial Corporation Pipeline System		コピー	○				First Philippine Industrial Corporation	JR・CR()・SR	
12.	Gas Quality Specification		コピー	○				Shell Philippines Exploration B.V.	JR・CR()・SR	

番号	資料の名称	発行日	形態 (図書・地図等)	収集資料	専門家 作成資料	JICA 作成資料	テキスト	発行機関	取次区分	図書館記 入欄
13.	Plan Layout of Manila Gas Main Distribution Lines	1983/8/5	図面	○				Manila Gas Corporation	JR・CR()・SR	
14.	Reply on JICA Questionnaire		コピー	○				Manila Gas Corporation	JR・CR()・SR	
15.	1998 Annual Report/ Operational Highlights of PNOC EC		図書	○				PNOC-EC	JR・CR()・SR	
16.	Final Report of the "Natural Gas as a New Energy Source of the Philippines"	1999/11	図書	○				PNOC-EC	JR・CR()・SR	
17.	PNOC Drilling Program 1999-2001		コピー	○				PNOC-EC	JR・CR()・SR	
18.	Composition of Camago- Malampaya Gas		コピー	○				DOE	JR・CR()・SR	
19.	Master Plan on Natural Gas Development and Utilization in ASEAN	1995/8	コピー	○				Gaz de France/Sofregaz	JR・CR()・SR	
20.	Petroleum Service Contract Map, As of January 14, 2000	2000/1/1 4	図面	○				DOE	JR・CR()・SR	
21.	Hydrocarbon Potential Map		図面	○				DOE	JR・CR()・SR	
22.	Location of Philippine Gas Resources		図面	○				DOE	JR・CR()・SR	
23.	Estimated Oil, Gas and Condensate Reserves,		コピー	○				DOE	JR・CR()・SR	
24.	Existing Landuse Map, Cagayan de Oro City	1999/11	図面	○				DTI-X	JR・CR()・SR	
25.	Road Map, Cagayan de Oro City	1998/9	図面	○				DTI-X	JR・CR()・SR	
26.	Cagayan de Oro City		地図	○					JR・CR()・SR	
27.	Road Map of Mindanao		地図	○					JR・CR()・SR	
28.	Sales of Electricity and Number of Customers (1992-99), CEPALCO		コピー	○				CEPALCO	JR・CR()・SR	
29.	Table of Organization, CEPALCO		コピー	○				CEPALCO	JR・CR()・SR	
30.	Five-year Forecast of kWh Sales		コピー	○				CEPALCO	JR・CR()・SR	

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	(2000-04), CEPALCO									
31.	69 kV line map, CEPALCO		コピ-	○				CEPALCO	JR・CR()・SR	
32.	Petroleum Consumption by Industry (1990-98),		コピ-	○				Department of Energy	JR・CR()・SR	
33.	Petroleum Consumption by Region (1991-98),		コピ-	○				Department of Energy	JR・CR()・SR	
34.	Price Data on Coal, Crude Oil, and Petroleum Products		コピ-	○				Department of Energy	JR・CR()・SR	
35.	1999 Electricity Energy Consumption		コピ-	○				Department of Energy	JR・CR()・SR	
36.	Installed Capacity (MW, as of December 1999),		コピ-	○				Department of Energy	JR・CR()・SR	
37.	List of Existing Power Plants(as of December 1999)		コピ-	○				Department of Energy	JR・CR()・SR	
38.	Philippine Energy Plan 1996-2025		コピ-	○				Department of Energy	JR・CR()・SR	
39.	1995 Household Energy Consumption Survey		図書	○				Department of Energy	JR・CR()・SR	
40.	List of Economic Zones		コピ-	○				Philippine Economic Zone Authority	JR・CR()・SR	
41.	ERB Primer		コピ-	○				Energy Regulatory Board	JR・CR()・SR	
42.	National Power Corporation, Average Rates per Customer Class, 1995-1999		コピ-	○				Energy Regulatory Board	JR・CR()・SR	
43.	Summary of Average Rates (of Electric Cooperatives), 1996-1998		コピ-	○				Energy Regulatory Board	JR・CR()・SR	
44.	ERB Presentation Materials (Hardcopy)		コピ-	○				Energy	JR・CR()・SR	

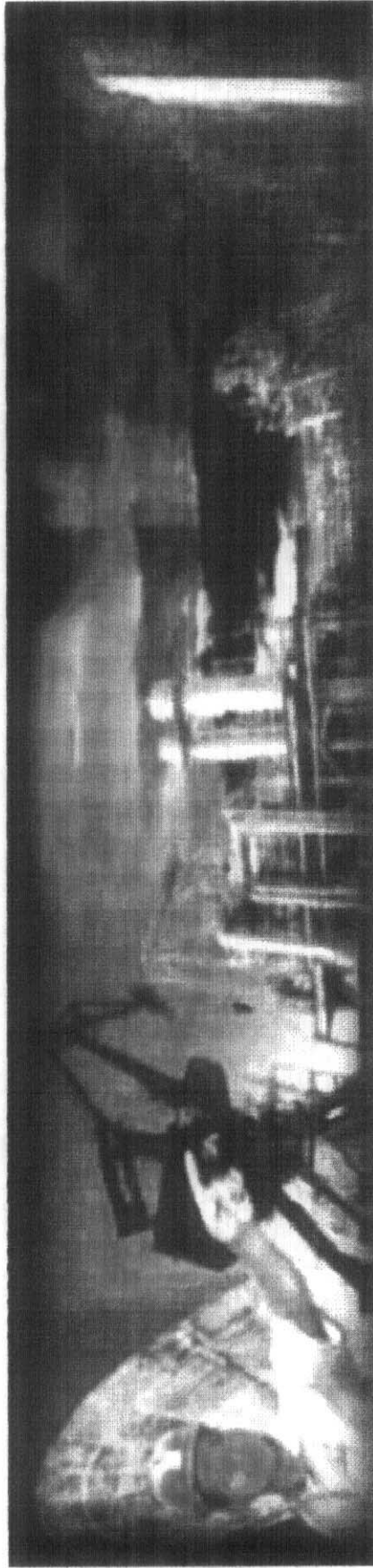
番号	資料の名称	発行日	形態 (図書・地図等)	収集資料	専門家 作成資料	JICA 作成資料	テキスト	発行機関	取扱区分	図書館記 入欄
	of Transparencies)							Regulatory Board		
45.	Energy Regulatory Board, "How Does ERB Determine Just And Reasonable Rates?"		コピー	○				Energy Regulatory Board	JR・CR()・SR	
46.	Executive Order No. 172, Creating The Energy Regulatory Board		コピー	○				Energy Regulatory Board	JR・CR()・SR	
47.	Republic Act No. 8479, An Act Deregulating The Downstream Oil Industry, And For Other Purposes		コピー	○				Regulatory Board	JR・CR()・SR	
48.	MERALCO 1998 Annual Report	1998	図書	○				MERALCO	JR・CR()・SR	
49.	MERALCO, Integrated Capacity Outlook		コピー	○				MERALCO	JR・CR()・SR	
50.	MERALCO, Integrated Energy Outlook		コピー	○				MERALCO	JR・CR()・SR	
51.	Load Factors and Capacity Factors		コピー	○				MERALCO	JR・CR()・SR	
52.	MERALCO's Franchise Area at a Glance as of December 1998		コピー	○				MERALCO	JR・CR()・SR	
53.	Number of Industries per Sector, per Year of Registration with the Board of Investment from 1990-1999		コピー	○				Board of Investment	JR・CR()・SR	
54.	CEPARCO 会社カタログ		図書	○				CEPARCO	JR・CR()・SR	
55.	CEPARCO 管内単線結線図		図面コピー	○				CEPARCO	JR・CR()・SR	
56.	2000-2004 年販売予測		資料コピー	○				CEPARCO	JR・CR()・SR	
57.	1992-1999 年 Growth Rate for Sale		資料コピー	○				CEPARCO	JR・CR()・SR	
58.	MINERGY 会社カタログ		図書	○				MINERGY	JR・CR()・SR	
59.	Regional Economic Situationer Region X		資料コピー	○				ODOCCY	JR・CR()・SR	
60.	Tributary Area		地図コピー	○				PETRON	JR・CR()・SR	

番号	資料の名称	発行日	形態 (図書・地図等)	収集資料	専門家 作成資料	JICA 作成資料	テキスト	発行機関	取扱区分	図書館記 入欄
61.	Competitive Sales Data		資料コピー	○				PETRON	JR・CR()・SR	
62.	CIC-SDC プレゼン資料		資料	○				CIC-SDC	JR・CR()・SR	
63.	誘致紹介資料		フロッピー	○				CIC-SDC	JR・CR()・SR	
64.	Annual Report		図書	○				CIC-SDC	JR・CR()・SR	
65.	誘致用パンフレット		図書	○				CIC-SDC	JR・CR()・SR	
66.	Iligan への誘致パンフレット		図書	○				CGY-DTI	JR・CR()・SR	
67.	Existing Industrial Estate		地図	○				CGY-DTI	JR・CR()・SR	
68.	Region 10 Investment Performance		資料コピー	○				CGY-DTI	JR・CR()・SR	
69.	Region 10 Export Performance		資料コピー	○				CGY-DTI	JR・CR()・SR	
70.	1999 Northern Mindanao Facts & Figures		資料コピー	○				CGY-DTI	JR・CR()・SR	
71.	Misamis Oriental		資料コピー	○				CGY-DTI	JR・CR()・SR	
72.	Contents of "Master Plan"		資料コピー	○				CGY-DTI	JR・CR()・SR	
73.	工業団地の既設工場リスト		資料コピー	○				CGY-DTI	JR・CR()・SR	
74.	1999 NPC Power Development Program		資料	○				NPC	JR・CR()・SR	
75.	Operation Highlights (Company Brochure)		資料	○				NPC	JR・CR()・SR	
76.	Financial Highlights (Company Brochure)		資料	○				NPC	JR・CR()・SR	
77.	Grid Map		地図	○				NPC	JR・CR()・SR	
78.	Natural Gas Development プレゼン資料		資料	○				PNOC-EC	JR・CR()・SR	
79.	Projected Gas Demand for NCR & Luzon		資料コピー	○				PNOC-EC	JR・CR()・SR	
80.	Development of Energy Chapter R.A.7638		資料コピー	○				EIAB	JR・CR()・SR	

資料－3 Cagayan de Oro – Iligan Corridor
Special Development Project

CAGAYAN DE ORO - ILIGAN CORRIDOR

Special Development Project



<http://www.norminet.org.ph/cic/>

Our Vision

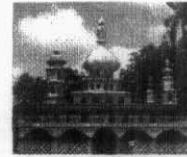
The CIC,

**“A Community of Strong, Productive,
& Dignified People”**

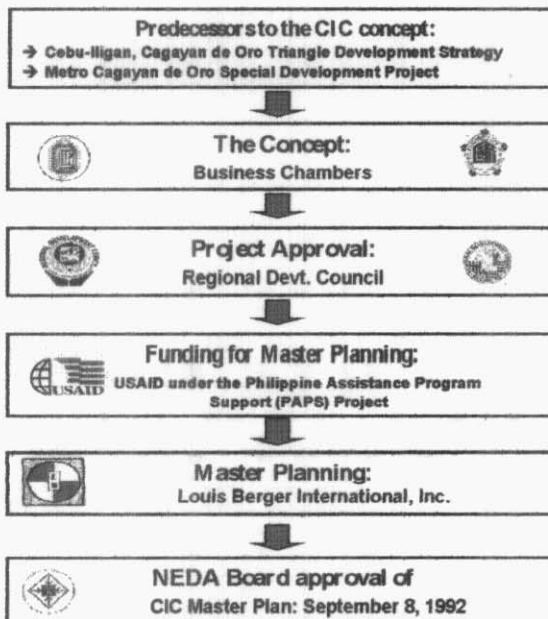
This we seek to achieve through sustainable and equitable development of this Corridor of Power as

- ❖ the Industrial Center of Southern Philippines,
- ❖ strongly complemented with globally competitive enterprises in Agribusiness, Trade, Tourism and Services.

In all these, we will work in Harmony, with Unity of Purpose and Utmost Respect for Cultural Diversity.



THE BIRTH OF THE PLAN

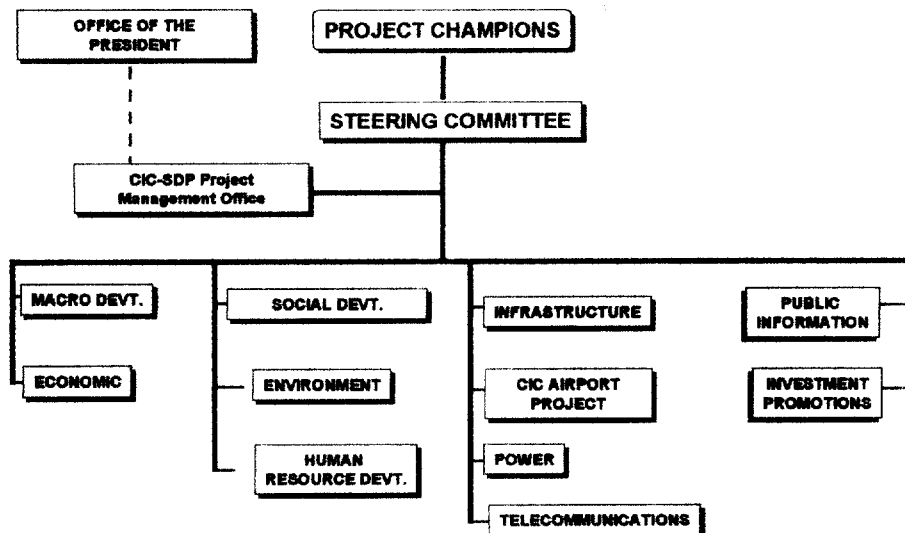


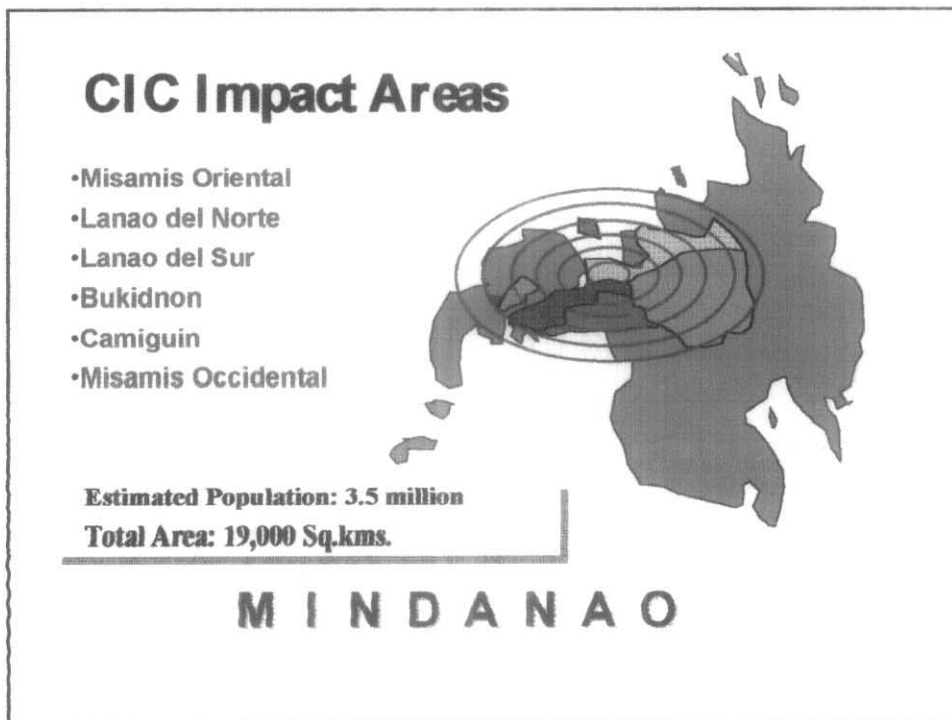
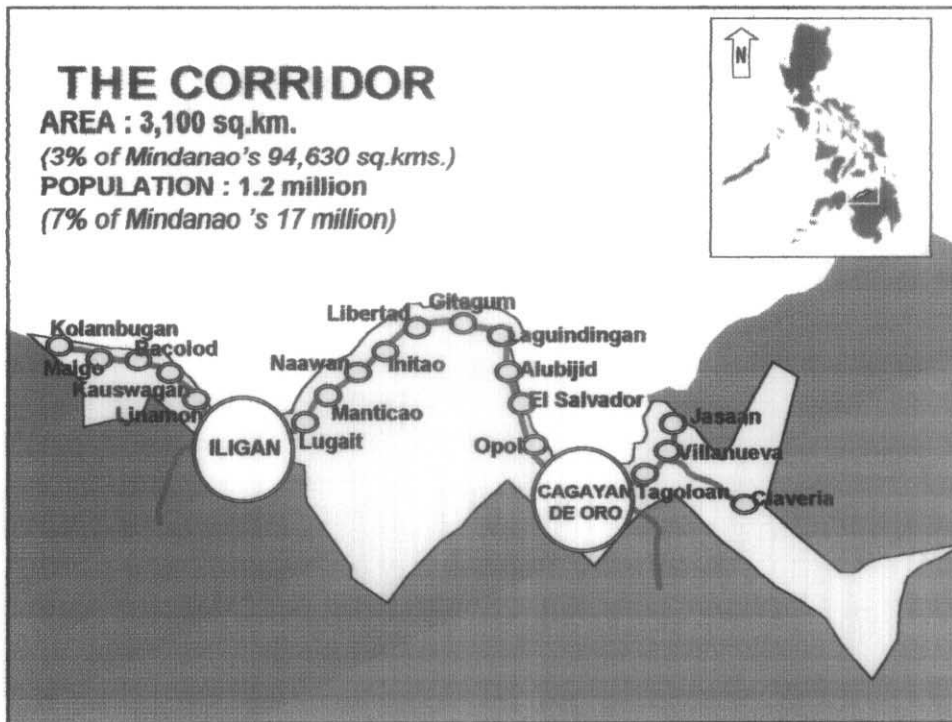
Executive Order No. 85



- signed last May 5, 1993
- established the coordinative and management mechanism of the CIC - SDP
- does not vest any implementation mandate on the CIC Steering Committee and the CIC-PMO
- implementation of projects still the responsibility of concerned LGUs and line agencies

The CIC Administration





The CIC

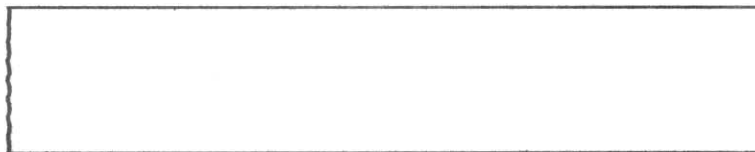
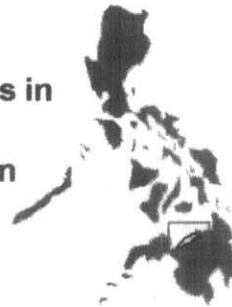
One of the priority agri-industrial areas in the country



Source: CCPAP

CIC's Development Roles

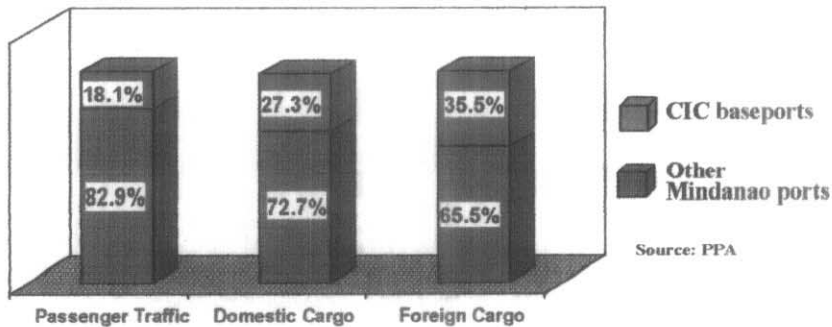
- Transshipment Hub of Mindanao
- One of Major Agri-Industrial Centers in Mindanao
- Trade & Services Center in Northern Mindanao
- Power Provider of Mindanao



Comparative & Competitive Advantages

Mindanao's Transshipment Point to Luzon and Visayas

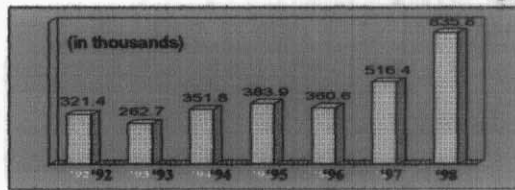
Mindanao Seaport Statistics 1992-1998



* Cagayan de Oro Baseport is consistently No. 1 in Mindanao from 1992 to 1998 in terms of volume of cargo handled.

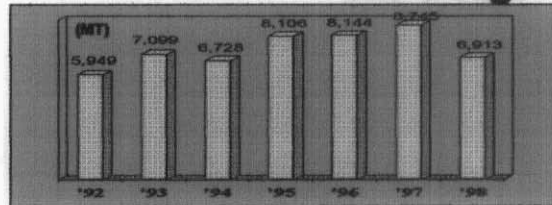
* Other ports like Zamboanga and Ozamiz ports have higher passenger traffic but this is due mainly to vessels serving commuters/travelers to adjoining Mindanao areas.

Air Passengers



- **No. 1** in Mindanao in 1998
- **61.8%** increase ('97-'98)

Air Cargo



- **2nd** to Davao in 1998 despite current constraints of facilities
- **3.5%** AGR ('92-'98)

Source: ATO

Home to major industries in Mindanao

Major Locator Manufacturing & Other Industrial Firms:

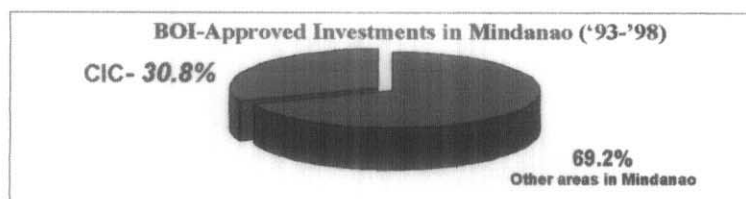
- ✧ Agri - Based = 34
 - ✧ Forest - Based = 29
 - ✧ Metal - Based = 21
 - ✧ Coco & Oleochemicals = 14
 - ✧ Chemical - Based = 10
 - ✧ Energy = 7
 - ✧ Consumer Manufacturing = 7
 - ✧ Beverages = 7
 - ✧ Mining/Metallurgical = 6
 - ✧ Construction Materials = 7
 - ✧ Others = 11
- TOTAL = 153**

CIC Investment Performance

BOI & Non BOI (1993-1998 in million PhP)

Year	CDO/Mis. Or.	Iligan /LdN	Total	%Change
1993	4,182.31	498.88	4,681.19	
1994	9,735.64	2,769.35	12,504.99	167.1
1995	4,063.26	8,785.52	12,848.78	2.7
1996	10,054.38	5,225.28	15,279.66	18.9
1997	16,369.14	5,803.76	22,172.90	45.1
1998 [□]	4,779.56	3,229.80	8,009.36	(63.9)
TOTAL	49,184.29	23,082.79	75,496.88	AGR 28.34%

□ 1998 figures for further verification



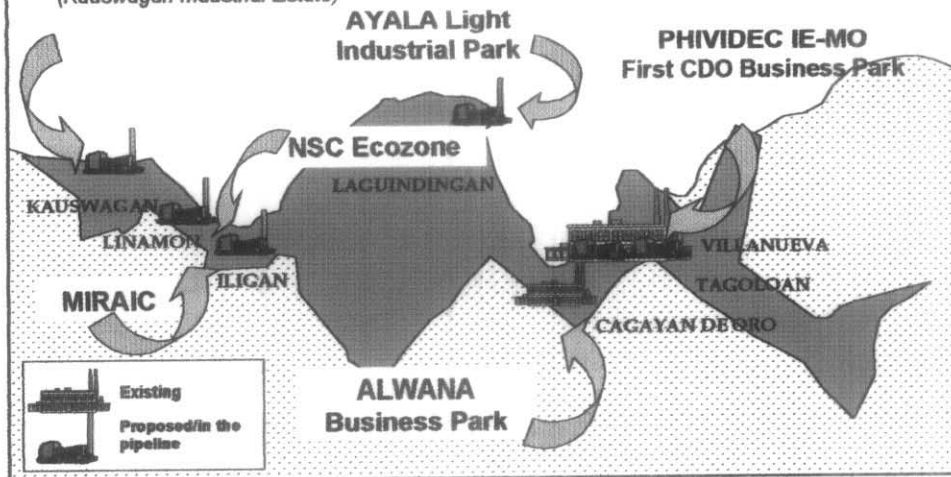
Sources: BOI, SEC, DTI Mis. Or./Luzon del Norte

Development Mechanisms & Strategies

Industrial Estates in CIC

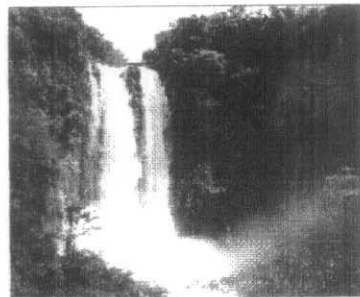
Lanao del Norte Provincial
Industrial Center

(Kauswagan Industrial Estate)

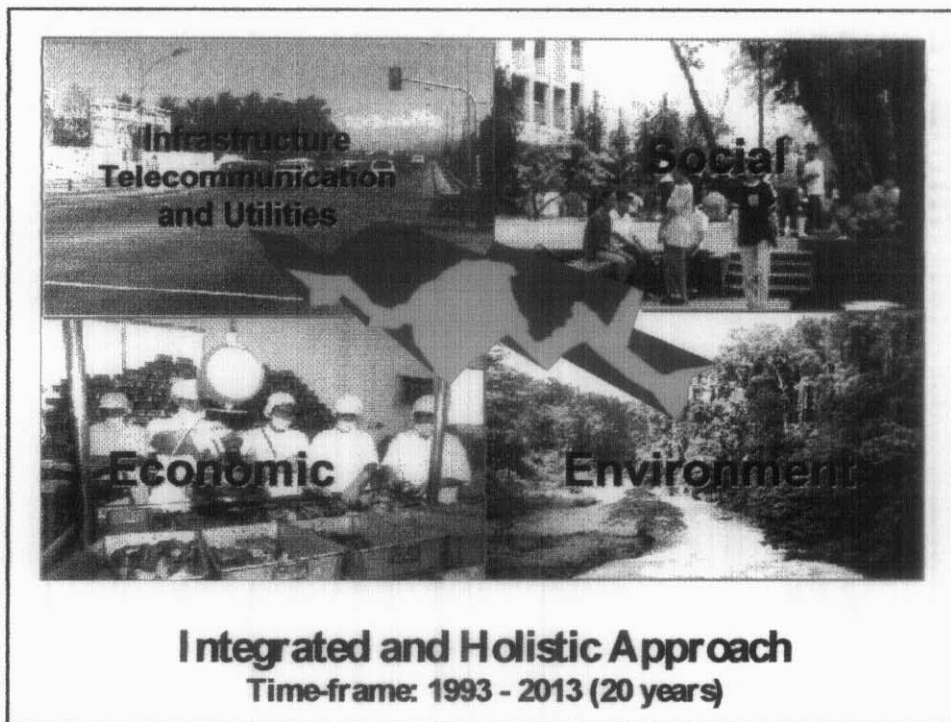


Adequate and Cheap Hydro-Based Power

*(61.8 % of Mindanao's
electric power comes from
CIC and its influence areas)*



*Power rates are 30% lower
than in Manila or Cebu*



Major infrastructure and utility projects being facilitated by CIC

- ⊕ **CIC (Laguindingan) Airport Development Project**
- ⊕ **Upgrading of Cagayan de Oro and Iligan Baseports per PPA Master Plan**
- ⊕ **The Mindanao Container Terminal Project at Phividec Industrial Estate- Misamis Oriental**
- ⊕ **The Iligan - Bukidnon Road**
- ⊕ **Water supply/distribution for private sector participation**



Soft components facilitated by CIC

- ❖ Social Development Framework Plan
- ❖ Human Resource Development
- ❖ Environment & Pollution Management Program
- ❖ Land Use Planning & Updating



Kolambugan, Lanao del Norte



Claveria, Misamis Oriental



Initao, Misamis Oriental



Manticao, Misamis Oriental

Thank You

Presentation by:
CIC-SDP Project Management Office
January 2000

資料－４ 国産天然ガスに関する資料 (DOE)



**Republic of the Philippines
DEPARTMENT OF ENERGY**

ESTIMATED OIL, GAS AND CONDENSATE RESERVES

I. DISCOVERED RESOURCES (Proven)

BASIN	Oil (MMBO)			GAS (BCF)			Condensate (MMBC)		
	Minimum	Most Likely	Maximum	Minimum	Most Likely	Maximum	Minimum	Most Likely	Maximum
1. NW Palawan	211.98	245.718	246.92	2,890.65	4,639.65	4,639.65	59.19	98.37	98.19
2. Cagayan					2.84				
3. Mindoro-Cuyo	18.70		37.40						
4. Visayan				2.00			0.19		
SUB-TOTAL	230.68	283.12	284.32	2,895.42	4,644.42	4,644.42	59.37	98.37	98.19

II. UNDISCOVERED RESOURCES (Potential)

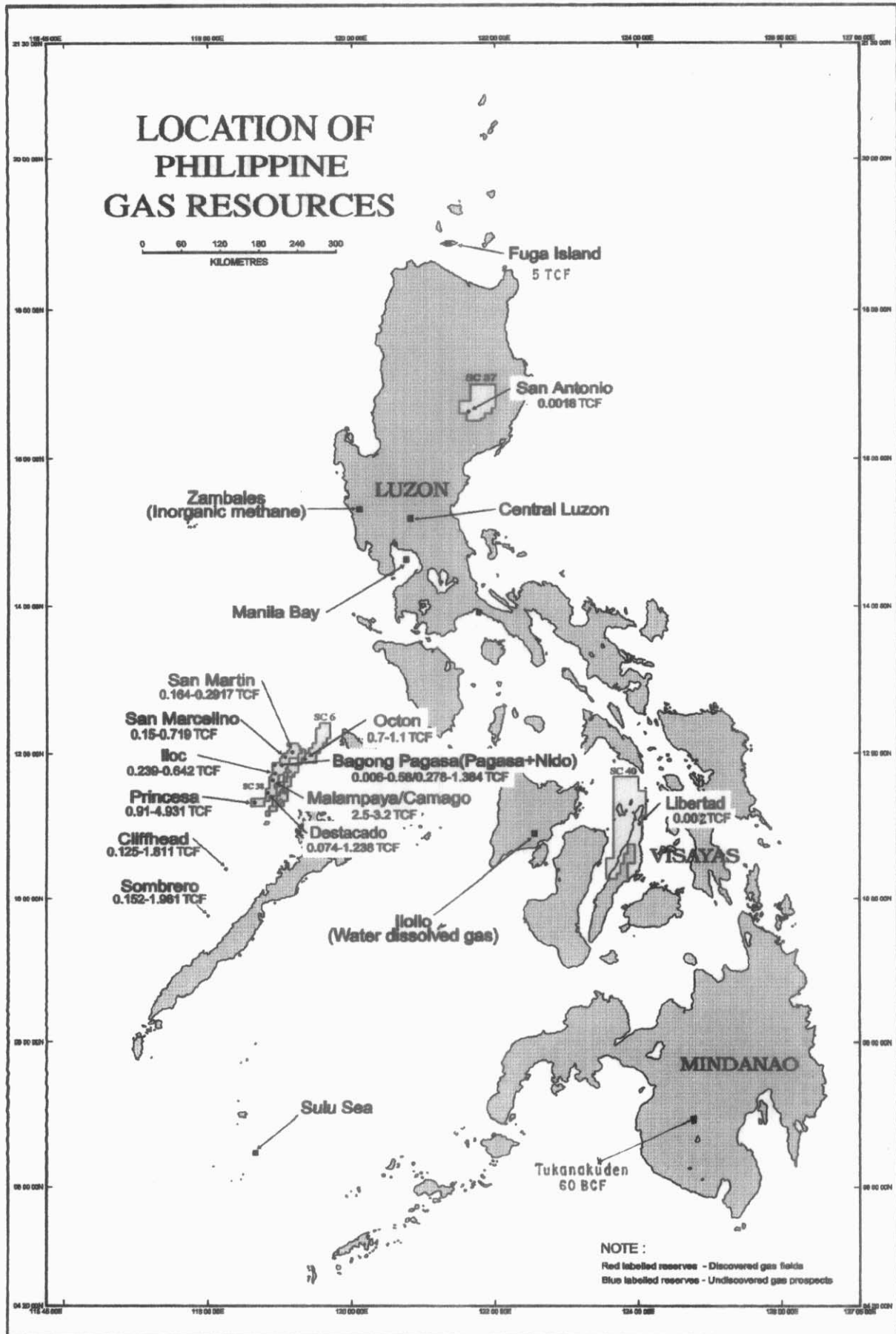
BASIN	Minimum	Most Likely	Maximum	Minimum	Most Likely	Maximum	Minimum	Most Likely	Maximum
1. NW Palawan	3,054.93	3,173.22	3,173.22	523.00	1,505.00	2,606.00			
2. Southeast Luzon	2,372.50	2,372.50	2,372.50						
3. Visayan	1,105.00	1,105.00	1,105.00						
4. Sandakan	1,545.00	1,545.00	1,545.00	6,749.00	6,749.00	6,749.00			
5. Mindoro-Cuyo	649.00	1,056.00	1,056.00	1,025.00	2,801.00	2,801.00			
6. South Palawan	52.00	262.00	648.00	306.00	1,308.00	3,185.00			
7. Reed Bank				300.00	800.00	800.00			
8. Cotabato	54.18	521.30	521.30	56.30	1,048.60	1,048.60			
9. Cagayan				5,000.00	5,000.00	5,000.00			
10. Central Luzon	454.33	1,486.92	2,450.27	77.86	637.01	2,594.30			
SUB-TOTAL	9,286.94	11,521.94	12,871.29	14,037.16	19,848.61	24,783.90			
GRAND TOTAL	9,517.62	11,805.06	13,155.61	16,932.58	24,493.03	29,428.32	59.19	98.37	98.19

MMBO - Million Barrels of Oil

BCF - Billion Cubic Feet of Gas

MMBC - Million Barrels of Condensate

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資料－５ 国産天然ガス資源及び Trans-ASEAN Gas Pipeline に関する資料 (PNOC-EC)



PNOC EXPLORATION CORPORATION

PNOC Energy Companies Bldg. 1, Merritt Road, Fort Bonifacio, Taguig, Metro Manila, Philippines
P.O. Box 2102 MCPO • Tel. No. 893-6001, 893-1320 • Fax: 845-3090

February 4, 2000

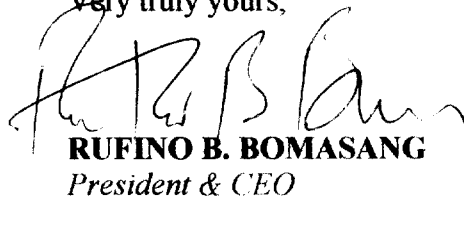
Ms. MIMA BAUTISTA-MACAHLIG
Project Liaison Officer
JICA Philippine Office
Pacific Star Building, G. Puyat cor. Makati Avenue
Makati City

Dear Ms. BAUTISTA-MACAHLIG:

As requested, we attach the following information on Natural Gas Resources of the Philippines and the Trans-ASEAN Gas Pipeline Project in response to your questionnaire for the “Viability Study on Natural Gas Industry Development” dated February 2, 2000.

We hope you find these information useful.

Very truly yours,



RUFINO B. BOMASANG
President & CEO

1. NATURAL GAS RESOURCES

1.1 PNOC EC Prospects for the Natural Gas Development

The successful development of the country's natural gas industry hinges on the several interdependent strategies, namely:

- a) a concerted effort to develop the market for natural gas;
- b) the setting up of a gas transmission and distribution infrastructure to support the initial switch to natural gas and to spur further market growth; and
- c) further exploration efforts in order to increase the country's gas reserves portfolio and, if indigenous gas supply is found to be inadequate, importation of natural gas via LNG and/or the Trans-ASEAN gas pipeline grid.

The Malampaya gasfield development will mark the birth of the Philippine natural gas industry. However, additional gas reserves are required to sustain its growth. As part of its Natural Gas Development Program, PNOC EC has been actively pursuing natural gas exploration and development efforts in the Philippines, among which are:

1. SC 38 (Camago-Malampaya)

PNOC EC has a 10% participation in this project. The project includes the 500-km offshore pipeline from Palawan to Batangas and the Malampaya gas field development. Proven and probable reserves currently stand at 3.34 TCF. Three major power plants (2700 MW) have already been committed to use the Malampaya gas.

2. GSEC 84 (Fuga Island Prospect)

Because of its proximity, low development costs and the sheer size of its projected gas reserves (estimates range from 2 to 18 TCF of gas), the Fuga Island Prospect in GSEC-84 (Babuyan Channel) presents itself as the best supply option for the intended gas markets in Luzon. Drilling of the Fuga-1 well has been scheduled during the 2nd quarter of 2000.

3. GSEC 73 (Cotabato Basin)

The size of the prospective gas reserves (600 BCF) in the Cotabato Basin and its distance from Luzon limits development options to the Mindanao area. PNOC-EC has successfully drilled and flowed gas from two wells in 1999. Production testing and additional wells are programmed for this year.

4. GSEC 88 (Offshore Mindoro)

The area lies along the pipeline route from Malampaya to Batangas. Combined gas reserves for the prospect is estimated at 1.8 TCF.

5. GSEC 76 (Ragay Gulf)

GSEC 76 has numerous medium-sized prospective gas reservoirs in shallow waters with combined gas reserves estimated at 3 TCF. Drilling of the first well is expected by 2000/2001.

Other exploration areas with PNOEC participation include GSEC 98 (*Onshore Mindoro*), GSEC 75 (Central Luzon) and SC 37 (South Cagayan).

1.2 MARKET DEVELOPMENT

The centerpiece of PNOEC's gas industry development strategy is the setting up of a gas transmission pipeline to be implemented in two stages. The first stage would serve industrial areas along the Batangas-NCR corridor and the second stage, the Clark-Limay-Subic areas.

Presently, the only market which can absorb the high-priced Malampaya gas is the power sector, in view of the high fuel conversion efficiencies of combined cycle gas turbine power plants. The industrial sector has been targeted for development of sufficient initial market demand, in particular, industries with "easy-to-convert" facilities and currently using LPG and/or diesel, these fuels being more expensive than Malampaya gas.

PNOEC conducted a study on "Natural Gas as a New Energy Source in the Philippines" from 1997 to 1999. The following are some of the project study conclusions:

- There is sufficient market demand for natural gas in the industrial sector to support transmission and distribution infrastructure along the Manila-Calabarzon corridor.
- Camargo-Malampaya gas is competitive mainly with the "high end" fuels, namely LPG and diesel (gas oil) in the industrial market.

Eventually, the commercial, residential and the transport sectors are expected to make a significant contribution to the market growth.

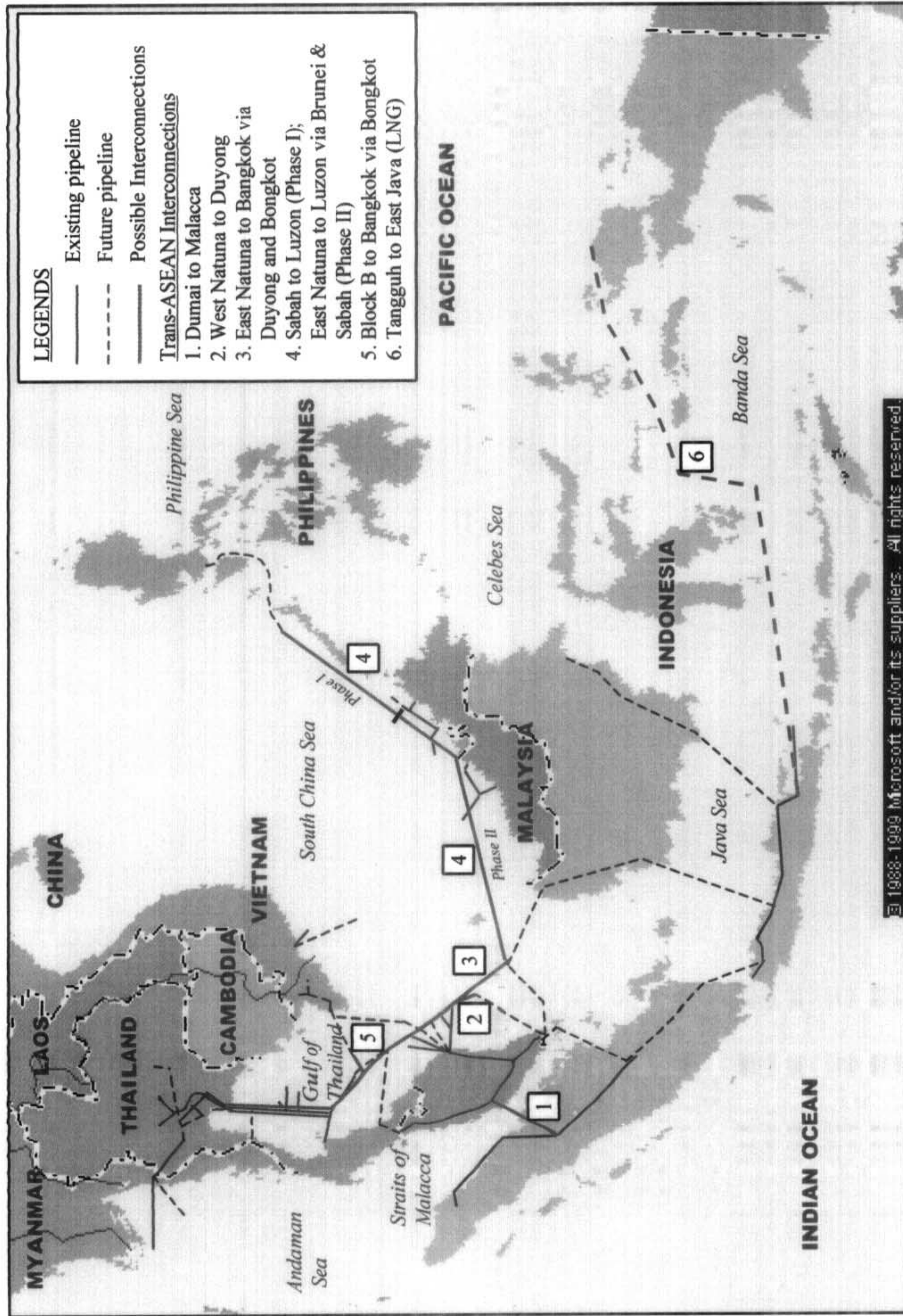
2. FEASIBILITY STUDY FOR THE TRANS-ASEAN GAS PIPELINE

If indigenous gas resources are found to be inadequate to sustain the expected growth in gas demand once transmission/distribution infrastructure is in place, the government is contemplating importation of natural gas via the TAGP Project, in particular from Sabah, where several 1 to 2 TCF gasfields have remained undeveloped because of insufficient market demand in Sabah.

The TAGP Project of the ASEAN Council on Petroleum (ASCOPE) endeavors to establish interconnecting arrangements in the field of energy and natural gas within ASEAN. The Sabah-Philippine leg has been identified as one of the priority projects.

The immediate work program for the Sabah-Philippine leg includes the identification of the supply source, firming up of the Philippine gas market demand, gas pricing, preliminary infrastructure design and cost estimates, and determination of institutional frameworks. The overall ASCOPE program calls for a conceptual study and update of the ASEAN-EC Energy Management Training and Research Center (AEEMTRC) Report, scheduled to be concluded in October 2000. The detailed feasibility study for the TAGP Project is programmed for completion in October 2001. Attached is the map of the proposed TAGP pipeline grid.

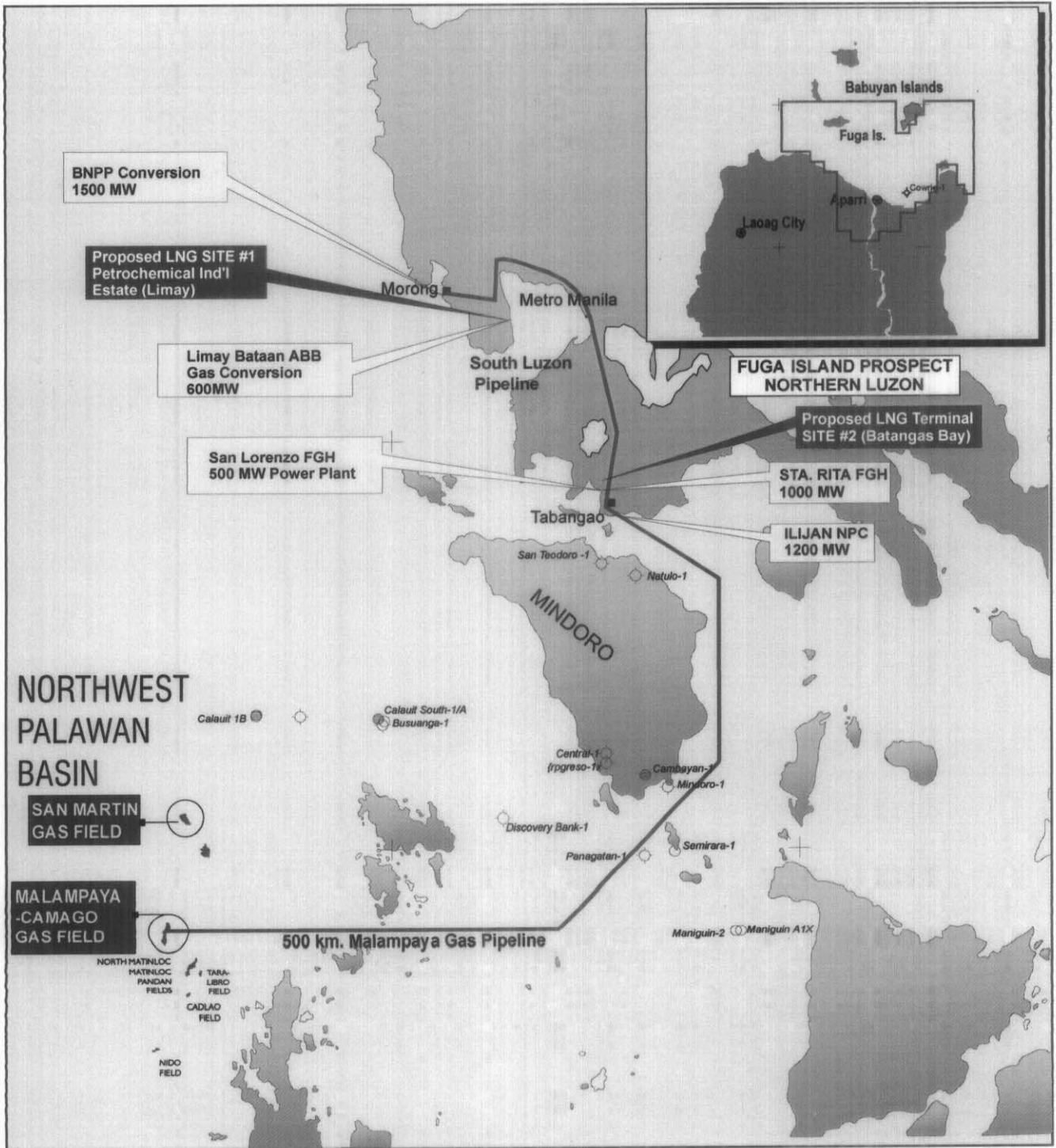
EXISTING AND FUTURE GAS INFRASTRUCTURE IN ASEAN



資料－6 Natural Gas Development Program
(PNOC-EC)



Exploration Corporation



DECEMBER 1999

NATURAL GAS DEVELOPMENT PROGRAM

In 1995, the Department of Energy mandated PNOC to take the lead role in expanding the Philippine natural gas industry beyond the Malampaya Gas-to-Power Project. The following is a status report on what PNOC-EC has accomplished as well as its plans towards furthering the Philippine natural gas industry.

The successful development of the natural gas industry in the country hinges on several interdependent strategies, namely:

1. A concerted effort to develop the market for natural gas;
2. The setting up of gas transmission and distribution infrastructure to support the initial switch to natural gas fuel as well as to spur further market growth; and
3. Renewed exploration efforts to increase the country's gas reserves portfolio and, if indigenous gas supply is found to be inadequate, interconnection to the proposed Trans-ASEAN gas pipeline infrastructure and/or the establishment of LNG import facilities in order to ensure security of supply.

UPSTREAM

The Malampaya Deepwater Gas-to-Power Project is the Philippines' largest infrastructure development project. This project is consistent with government's objectives to achieve energy self-sufficiency and promote the use of environment-friendly fuels. Shell has offered PNOC-EC up to 10% equity participation in the Malampaya license acreage, which includes the 500-kilometer pipeline from offshore Palawan to Batangas and the Malampaya gasfield development (proven and probable reserves currently stand at 3.34 TCF). Such participation allows PNOC-EC to access state-of-the-art technology in deepwater field development and pipeline construction. Moreover, it will strategically position PNOC-EC for participation in the Trans-ASEAN Gas Pipeline network in the future. Funding for such PNOC-EC participation will be in the order of US\$200 Million.

The Malampaya gasfield development will kick off the birth of the country's natural gas industry, but additional supply sources are required to sustain its growth. Although still subject to geological uncertainty, the prospects of additional supply from future gasfield discoveries are summarized as follows:

- Because of its proximity, low development costs and the sheer size of its projected gas reserves (estimates range from 2 to 18 TCF of gas), the Fuga Island Prospect in GSEC-84 (Babuyan Channel) presents itself as the best supply option for the intended gas markets in Luzon. However, exploration efforts have been stymied by the island owners' refusal to allow access to the island. The DoE and PNOC-EC have resorted to legal action in order to secure drilling access, although we continue to pursue efforts towards a mutually-beneficial longterm access agreement with the island owners (Tan Yu's Fuga Island Holdings Inc.). PNOC-EC and PNOC-EDC intend to drill the Fuga well during the Y2000 weather window.
- On the other hand, the size of the prospective gas reserves (600 BCF) in the Cotabato Basin and its distance from Luzon limits development options to the Mindanao area. PNOC-EC has successfully drilled and flowed gas from two wells in 1999. Production testing and additional wells are programmed in Y2000 to prove gas reserves in excess of 60 BCF for the Sultan-sa-Barongis discovery.

- Notwithstanding the high cost of offshore development, particularly for smaller reservoirs which cannot take advantage of economies of scale, and which impacts heavily on the price of gas landed in Luzon, other gasfield discoveries in offshore Northwest Palawan and Mindoro should be allowed to piggyback on Shell's Malampaya pipeline and facilities. PNOC-EC is operator of one of the acreages (GSEC-88, Offshore Mindoro) along the pipeline route from Malampaya to Batangas. The combined gas reserves in the drillable prospects in GSEC-88 have been estimated at 1.8 TCF.
- PNOC-EC has 20% participating interest in GSEC-76 (Ragay Gulf), located in the Bicol Region, which has numerous medium-sized prospective gas reservoirs in shallow waters, with combined gas reserves estimated at 3 TCF. The drilling of one well has been committed for the acreage and may be drilled in Y2000/2001.

MIDSTREAM

The centerpiece of PNOC-EC's gas industry development strategy is the setting up of a South Luzon gas pipeline grid to serve the high growth centers along the Manila-CALABARZON corridor and, as a second stage, the Clark-Limay-Subic areas. This transmission/distribution pipeline infrastructure calls for investments in the order of US\$45 Million for the Batangas-NCR leg. In the absence of private sector initiative for this project, there should be willingness on the part of government to underwrite the cost of development for the national interest and future growth. An infrastructure development subsidy from the national government may be needed in view of the expected initial low revenue stream. Possible funding support may come from government's share of gasfield revenues, which can be plowed back to these pipeline infrastructure projects through PNOC, similar to Malaysia's PETRONAS and Indonesia's PERTAMINA, although such arrangement will require legislation.

There may also be a need for government to mandate PNOC-EC's participation in this project via a South Luzon pipeline franchise, or failing that, a natural monopoly needs to be established to take advantage of economies of scale and avoid uneconomic duplication of facilities. The South Luzon pipeline grid becomes a contract carrier pipeline network, providing services on a first-come-first-served basis.

The Sabah-Palawan leg of the proposed Trans-ASEAN Gas Pipeline network has been adopted by the ASEAN Council on Petroleum as one of its priority projects. This project will allow the Philippines to utilize offshore gasfields (each 1 to 2 TCF in size) in Sabah, which would otherwise remain undeveloped because of the lack of a market in Sabah.

Another supply option is LNG importation, which has significant strategic importance in that it allows the growth of the Philippine gas industry without reservations on the availability of additional indigenous supply from future gasfield discoveries. Currently, LNG pricing is competitive with Shell gas landed in Tabangao, although this competitiveness may fall in the face of future gasfield discoveries. Moreover, due to the extensive infrastructure investments in LNG facilities, longterm viability and sufficient demand should first be firmly established. Integration of the LNG import facility with the conversion of the Bataan Nuclear Power Plant to gas-firing or a major greenfield CCGT facility in the Bataan area (as its anchor load) would be the ideal approach to gas supply importation.

DOWNSTREAM

The power sector provides a ready competitive market for natural gas in view of the energy conversion efficiencies of combined-cycle gas turbine (CCGT) power plants. It is for this reason that high-priced Malampaya gas has found buyers in NPC and First Gas Holdings for their power plants in Batangas. These gas-fired power plants should have provided sufficient anchor loads to ensure initial viability of the pipeline infrastructure needed to bring the gas to other market sectors. However, the decision by NPC and FGH to locate these power plants in Batangas near the Tabangao landing point for Malampaya gas precludes immediate commercial viability for an NCR-Calabarzon transmission pipeline. Of the current inventory of power plant projects that have been proposed for implementation to address the power supply shortfall expected after Y2005, the conversion of the Bataan Nuclear Power Plant into a 1,500-MW gas-fired facility presents a suitably-sized initial gas market that could serve as anchor load for the transmission and distribution infrastructure needed to spur demand for natural gas in the industrial, commercial and household sectors around the Limay-Subic areas.

PNOC-EC operates the first commercial gas-fired power plant in the country: the San Antonio Gas Project in Echague, Isabela. Although this 3-MW plant pales in comparison with the Malampaya CCGTs, it is able to provide electricity to 3 towns in Isabela and parts of Santiago City. Additional generating capacity may be forthcoming, with the contemplated drilling in Y2000 of the South Rizal Prospect, located 10 kilometers from the San Antonio gasfield. PNOC-EC intends to replicate this achievement in other parts of the country, where small onshore gasfields could be commercially exploited. In particular, a 50- to 60-MW gas-fired power plant is programmed for our Cotabato acreage, once reserves estimated at 60 BCF are proven for the Sultan-sa-Barongis discovery.

In addition to the power plant anchor loads, the sector that has been targeted for development of sufficient initial market demand is the industrial sector, in particular, industries with "easy-to-convert" facilities and currently using LPG and/or diesel, these fuels being more expensive than Malampaya gas landed in Luzon. Demand in the industrial sector is elastic to gas price. Future gasfield discoveries will allow more competitive pricing for natural gas which, in turn, will promote further market growth in the industrial sector. Eventually, it is envisioned that market growth will spill over to commercial and household users (in particular, LPG substitution for cooking applications, in view of the high price differentials) and then into the transport sector.

PNOC-EC has undertaken a comprehensive market study for gas demand by industries along the NCR-Calabarzon corridor, which has been identified as the immediate industrial demand area for natural gas fuel. Similar market studies are programmed in Y2000 for Region 3 and Mindanao.

PNOC may also contemplate direct participation in the development of future gas markets through the setting up of specialized subsidiaries, similar to the market jumpstarting efforts by Malaysia's PETRONAS.

Brief on the Fuga Island Prospect under GSEC 84

Licence Information

The Geophysical Survey and Exploration Contract (GSEC) No. 84 covers 8,300 square kilometers of predominantly offshore license acreage off the North coast of Luzon and is some 300 kilometers south of Taiwan.

The Department of Energy (DoE) awarded operator of the acreage, Sydney-based Stirling Resources N.L. a Non-Exclusive Geophysical Permit (NGP) over the block in April 1993 and was subsequently upgraded to a GSEC on 22 March 1996. Currently, the DoE has issued a moratorium over the GSEC obligations (which includes the drilling of one well) pending the resolution of access rights to the island with Tan Yu's Fuga Island Holdings.

The GSEC 84 Consortium Partners and their current Participating Interests are as follows:

PNOC EC (Operator)	15%
STIRLING	25%
EURO-PACIFIC	27.5%
HARDMAN RESOURCES	22.5%
SOCDET	10%

PNOC EC and PNOC EDC will acquire interests from the Australian partners, to each end up with 39.375%.

Exploration History

Only one well has been drilled in the acreage, Cowrie 1 Well which was drilled in May 1981 by a French exploration company, TOTAL and was plugged and abandoned after reaching a total depth of 1,500 meters and flowing 1.8 MMscfd of gas. Stirling Resources has classified the Cowrie-1 prospect as a subcommercial gas discovery with estimated reserves of 100 Million cubic feet of gas.

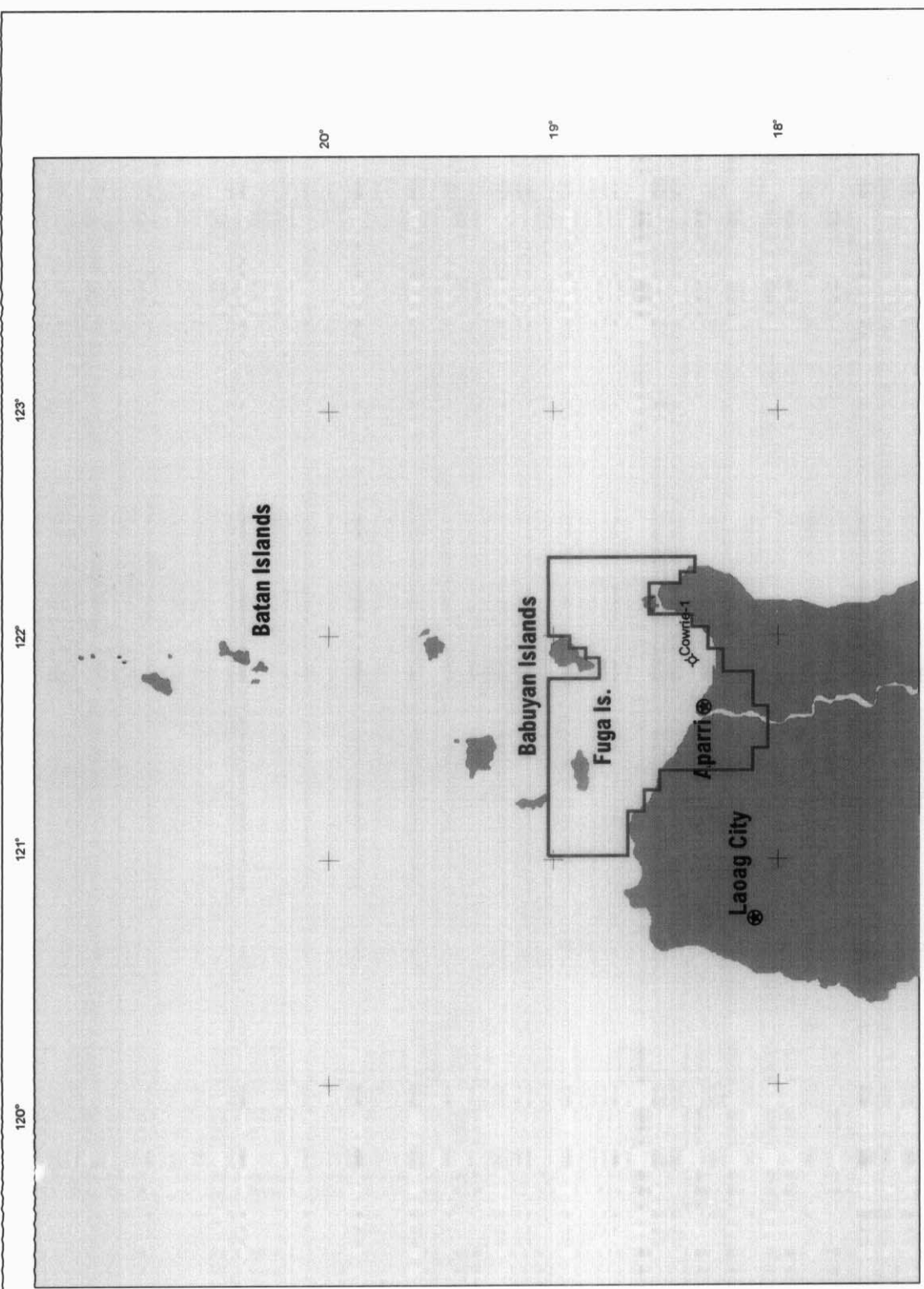
The Consortium acquired 227 line kilometers of new seismic data in 1997 near and around Fuga Island.

Current Work Program

The Fuga Island prospect is the focus of exploration efforts by the GSEC 84 Consortium. The prospect is manifested at the surface as Fuga Island, 22 Kms. Long x 6 Kms. wide and located 30 kms. North of the northwestern coast of Island of Luzon in the Babuyan Channel. Nearest town is Aparri located 90 Kms. southeast of the Fuga Island. Drilling of the Fuga-1 well is scheduled in the first half of 2000.

Technical prognosis conducted by Stirling on the Fuga Island Prospect has placed recoverable reserves potential at between **2 to 18 Trillion cubic feet of gas**.

The Well Fuga No.1 is programmed to be drilled to a total depth of 2,200 meters to test the hydrocarbon potential of the Fuga Island Prospect. Drilling prognosis has pinpointed the optimum drilling location to be on the western corner of Fuga Island.



GSEC Acreage: 8,300 sq.km.



GSEC 84-OFFSHORE BABUYAN LOCATION MAP

Brief on the Cotabato Basin Shallow Gas Integrated Project

Background

PNOC EC is the operator in the Cotabato Basin under GSEC 73. PNOC EC has 87.5% participating interest in Block A of the GSEC while Petrofields holds the other 12.5% participating interest. PNOC EC holds 100% interest in Block B.

Recent Exploration History

The Tukanakuden-1 well was drilled and was completed on 28 February 1996 after reaching a total depth of 4,700 feet. The well did not find the deeper oil reservoir objective but encountered shallow methane gas at 1,500 depth.

Two wells, Sultan-Sa-Barongis 1 & 2, were also drilled by PNOC EC in the "Sole Area" (Block A, GSEC 73) during the third quarter of 1999. Both wells flowed natural gas. PNOC EC is presently conducting extended well tests for these wells to determine the producibility of the gas.

Potential Gas Reserves

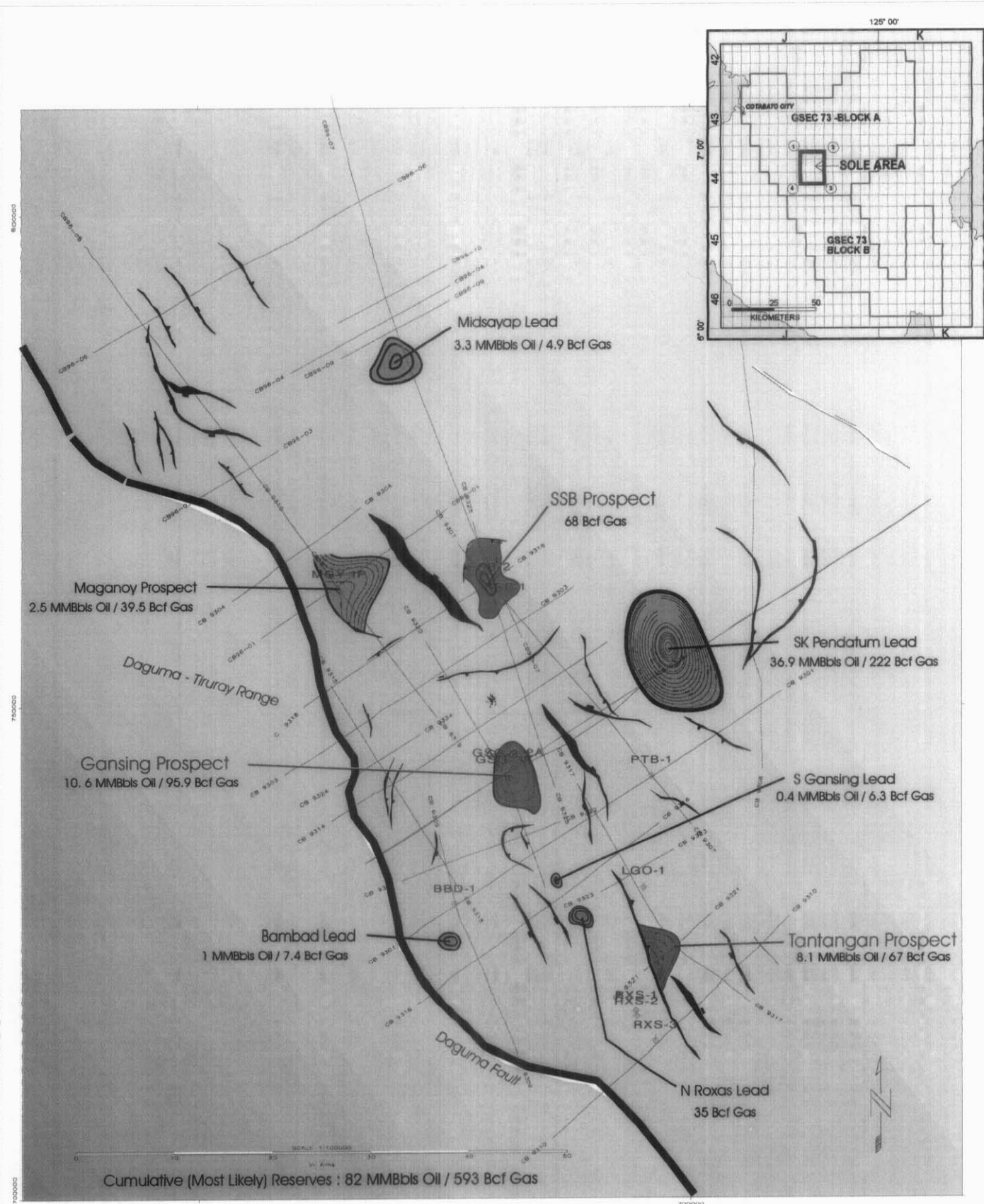
Technical prognosis shows that the basin has combined recoverable reserves of 600 Billion cubic feet (Bcf) gas and 82 Million Barrels of Oil equivalent. Of these, about 200 Bcf of gas are from shallow gas deposits, which includes the Sultan-Sa-Barongis Prospect. By itself, the Sultan-Sa-Barongis prospect, with estimated recoverable reserves of 60 Bcf, is projected to produce enough gas to fuel a 60-MW combined cycle power plant for 20 years.

Potential Gas Users

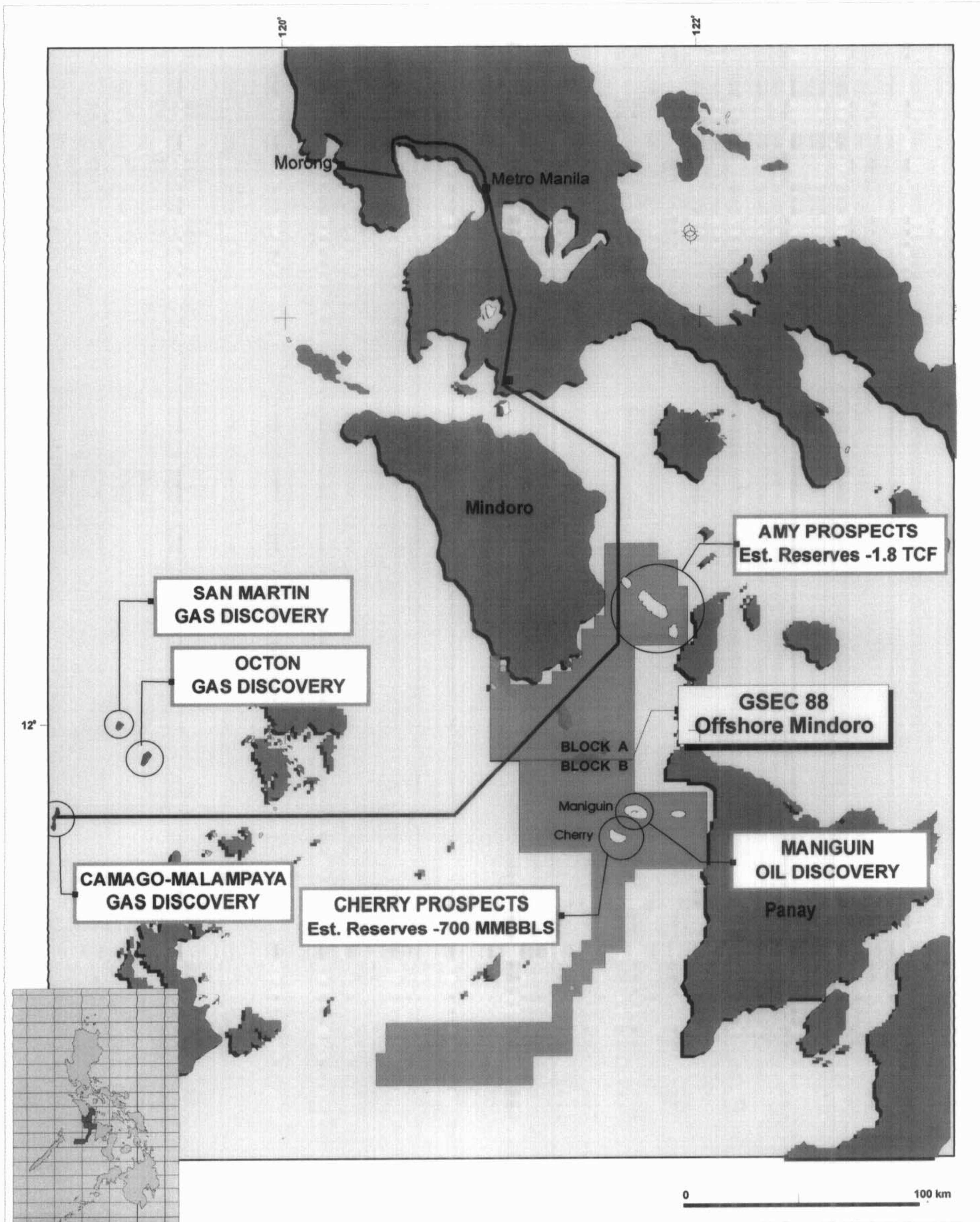
Once commercial quantity of gas has been confirmed, PNOC EC intends to utilize the gas for power generation to support power requirements of the Mindanao Island. PNOC EC is also looking at the possibilities of using this indigenous source of energy for industrial applications.

Forward Work Program

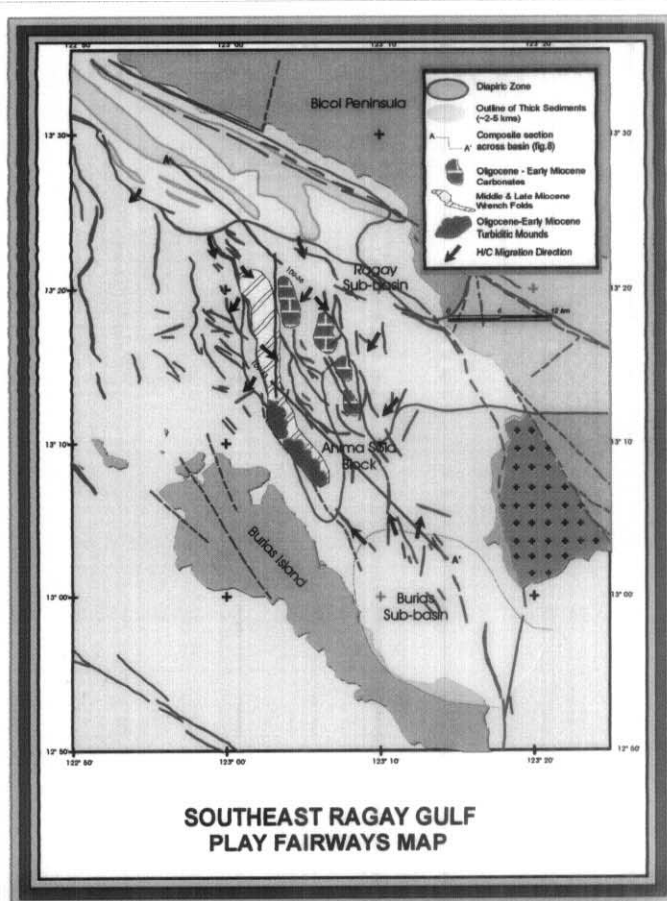
In addition to the wells already drilled, PNOC EC has programmed the drilling of three (3) more wells by year 2000 to further delineate the gas discovery in the area and to explore other identified prospects in the acreage. The first well, **Sultan-Sa-Barongis 3**, is estimated to cost **US\$1.2 Million**. The other two wells, **Tantangan** and **Gansing** are estimated to cost **US\$1.5 million** and **US\$ 3.0 million**, respectively. Design, Engineering, Procurement and Construction of a 60 MW gas turbine power plant is expected to be completed by the year 2003.



COTABATO BASIN (GSEC 73) PROSPECTS AND LEADS MAP



OFFSHORE MINDORO (GSEC 88) LOCATION MAP



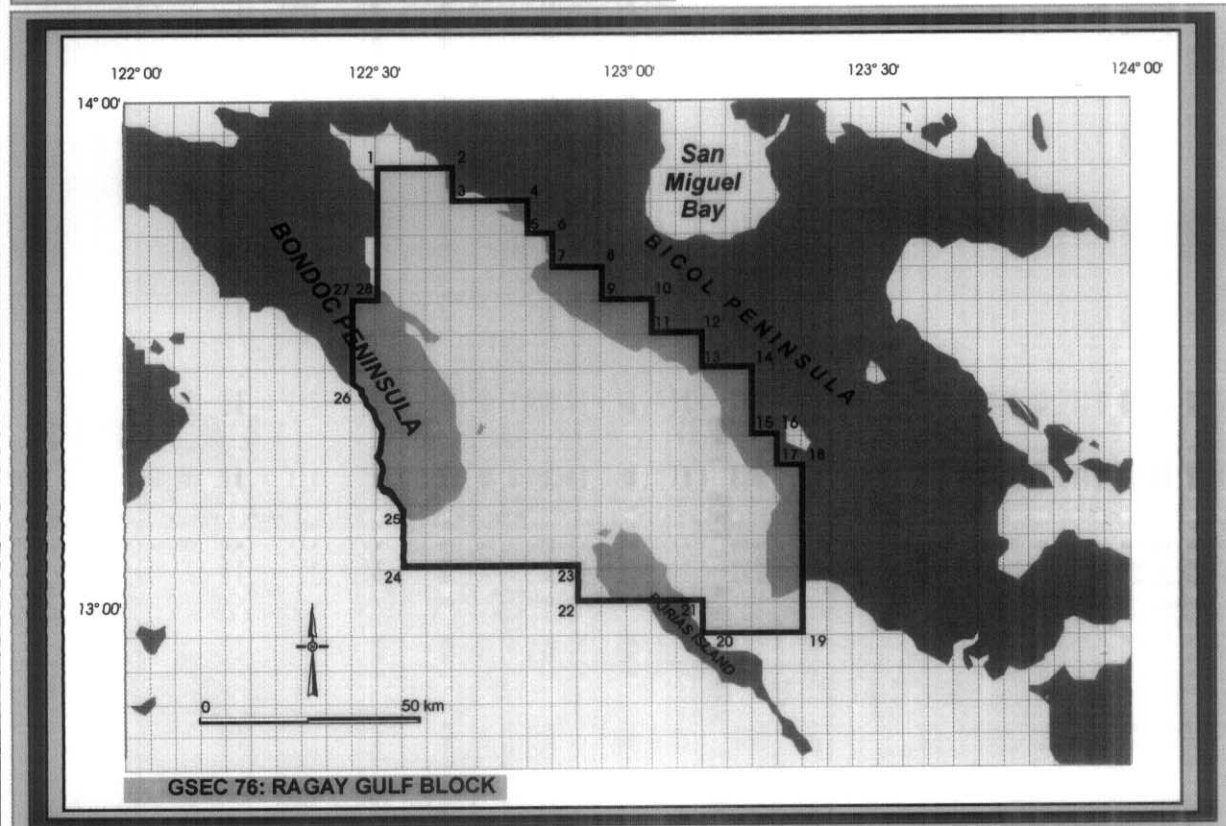
GSEC-76 was awarded by the DoE on July 21, 1994 to a consortium led by Globex Far East; initial contract term was for 12 months; subsequently extended on several occasions upon committing to drill one option well.

GSEC-76 was amended during the 3rd quarter of 1997 to include the partners and acreage of the then expired adjacent GSEC-79 operated by PNOC-EC.

Globex and PNOC EC are co-operators of the amended GSEC-76. The consortium will be conducting high-resolution seismic acquisition program. Drilling of one offshore well is being planned after July 2000.

The GSEC-76 Consortium is composed of the ff:

GLOBEX	40.00%
PNOC EC	20.19%
Basic Petroleum	8.65%
Oriental Petroleum	8.65%
PetroEnergy	8.65%
ALCORE	4.62%
Phoenix Energy	4.62%
Southwest Resources	2.31%
Seafront Resources	2.31%



GSEC 76 - RAGAY GULF

Brief on GSEC 98 (Onshore Mindoro)

Geophysical Survey and Exploration Contract No. 98 , covering 572,000 hectares in onshore Mindoro area, was granted by the DOE on June 23, 1998 to Philodrill Corporation, as operator. The GSEC has a term of 24 months with a one-well commitment. PNOEC has a 7.5% carried interest in the first well but is a paying party in the G & G and G & A.

Consortium Members

PNOEC	7.500 %
Philodrill (Operator)	41.131 %
Alsons	30.347 %
Anglo	10.636 %
VIMC	5.318 %
Basic	5.068 %

Background

- A well, Cambayan-1 was drilled in the area in April 1994 and flowed gas. The reserves however, was declared non-commercial by the previous operator, Anderman Smith.
- Anderman Smith sold its interests to Philodrill and Alsons in February 1998.
- GSEC 81 expired on February 27, 1998. A new GSEC 98 was awarded to Philodrill covering the same GSEC 81 area
- Several oil and gas seeps have been reported in the island confirming that hydrocarbons have been generated.

Hydrocarbon Potential

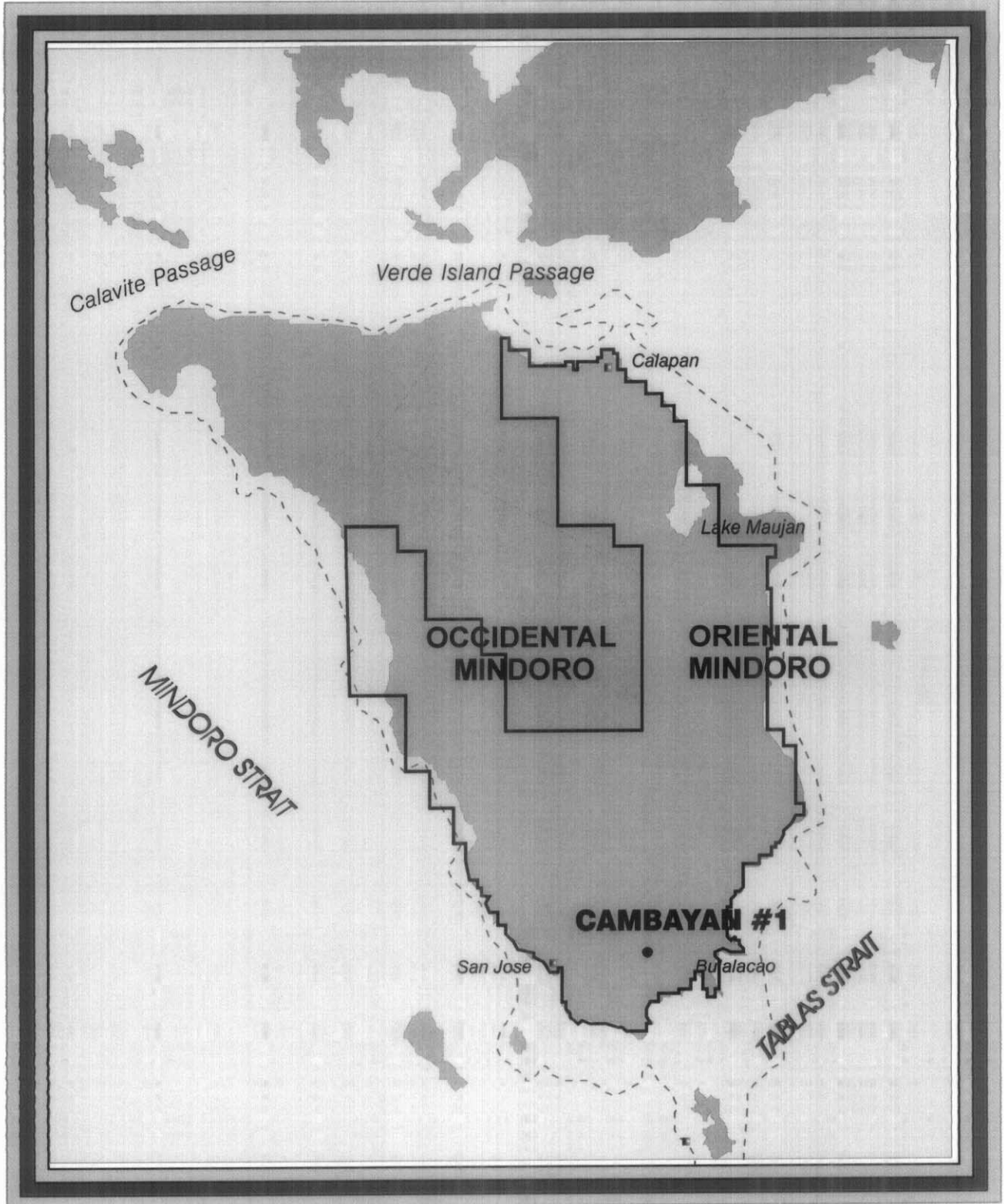
- Part of the NW Palawan continental block, the only proven oil province in the Philippines
- Numerous oil & gas seeps
- Good source and reservoir rocks with 4-way dip closures
- Numerous leads & prospects

Economic/Development Potential

The proposed Camago-Malampaya pipeline will be placed some distance from onshore Mindoro. This will allow easy access to the gas markets in Luzon for any gas discovery in the area.

Work Program

The two-year Work Program, as presented by the Operator, entails reprocessing and interpretation of 600 line kilometers of 2 D seismic data to be complemented by detailed seismic works. A geochemical survey may also be implemented if warranted. Drilling of the first well is expected by year 2000, within the current GSEC term.

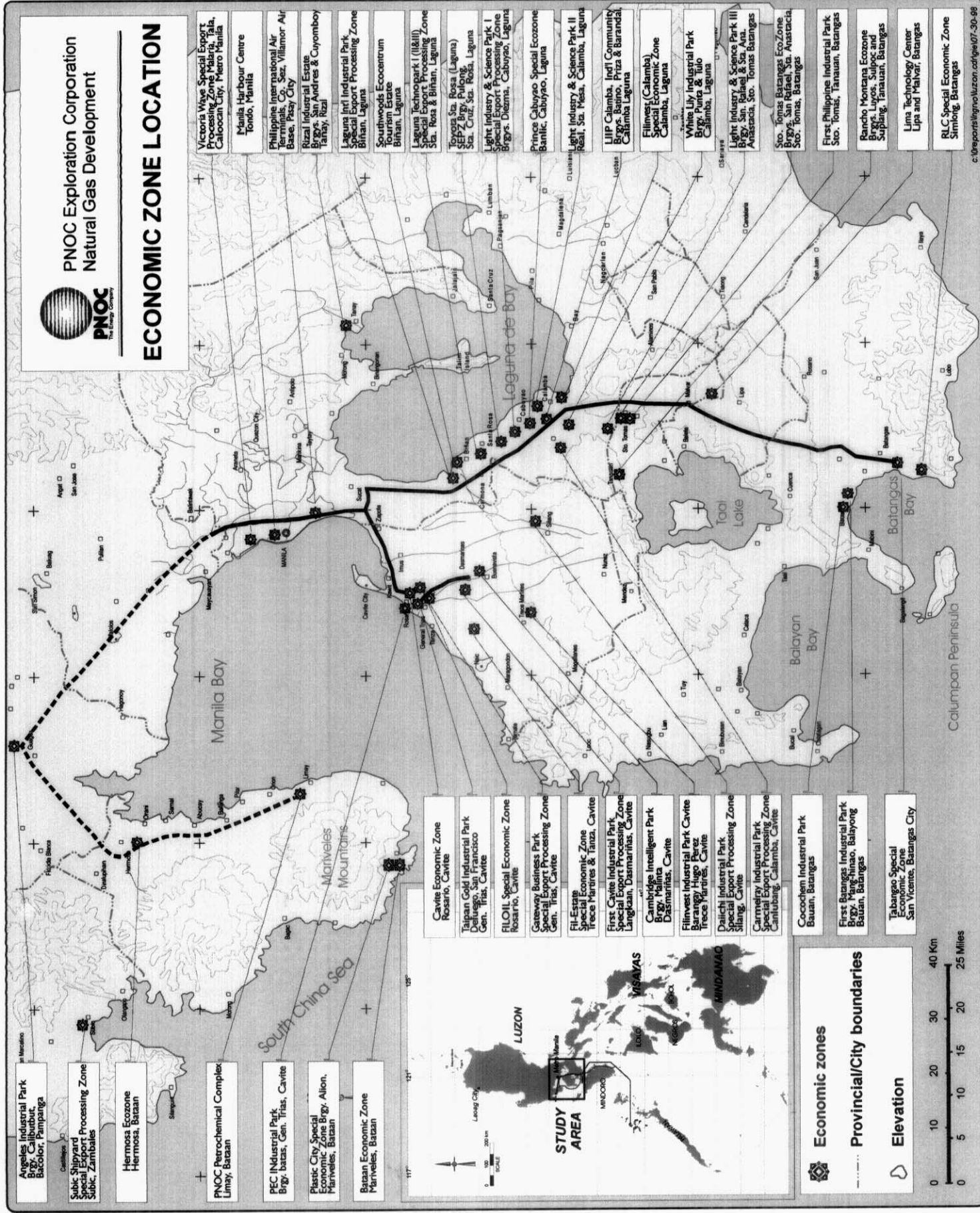


ONSHORE MINDORO (GSEC 98) LOCATION MAP



PNOC Exploration Corporation
Natural Gas Development

ECONOMIC ZONE LOCATION



Angelles Industrial Park
Brgy. Cabubut, Pampanga

Subic Shipyard Processing Zone
Subic, Zambales

Hermosa Ecozone
Hermosa, Batasan

PNOC Petrochemical Complex
Limay, Batasan

PEC Industrial Park
Brgy. batas, Gen. Trias, Cavite

Plastic City Special Economic Zone
Brgy. Allon, Mariveles, Batasan

Bataan Economic Zone
Mariveles, Batasan

Cavite Economic Zone
Rosario, Cavite

Talipan Gold Industrial Park
Gen. Trias, Cavite

FILOIL Special Economic Zone
Rosario, Cavite

Gateway Business Park
Special Export Processing Zone
Gen. Trias, Cavite

Fit-Estate Special Economic Zone
Ireco Maritres & Tanza, Cavite

First Cavite Industrial Park
Special Export Processing Zone
Langkaan, Dasmariñas, Cavite

Cambridge Intelligent Park
Brgy. Malina Dasmariñas, Cavite

Fitinvest Industrial Park
Brgy. Hino, Cavite

Daiichi Industrial Park
Special Export Processing Zone
Sillang, Cavite

Carmelray Industrial Park
Special Export Processing Zone
Cantubang, Calamba, Cavite

Cocokem Industrial Park
Bauan, Batangas

First Batangas Industrial Park
Brgy. Manghinog, Balayong Bauan, Batangas

Tabangao Special Economic Zone
San Vicente, Batangas City

Victoria Wyse Special Export Processing Zone
Caticlan City, Palawan

Manila Harbour Centre
Tondo, Manila

Philippine International Air Terminals
Co. Sez, Villamor Air Base, Pasay City

Rizal Industrial Estates
Brgy. San Andres & Cuyombo, Taytay, Rizal

Laguna Inrl Industrial Park
Special Export Processing Zone
Biran, Laguna

Southwoods Ecozentrum
Taraque Estate, Birhan, Laguna

Laguna Technopark I (I&II)
Special Export Processing Zone
Sta. Rosa & Birhan, Laguna

Tovosa Sta. Rosa (Laguna)
SEPPZ Brgy. Pulong, Sta. Cruz, Sta. Rosa, Laguna

Light Industry & Science Park I
Special Export Processing Zone
Brgy. Diliam, Cabuyao, Laguna

Prince Cabuyao Special Ecozone
Bantlic, Cabuyao, Laguna

Light Industry & Science Park II
Resal, Sta. Piedad, Calamba, Laguna

LJIP Calamba, Inrl Community Brgy. Batino, Priza & Barandaj, Calamba Laguna

Filinvest (Calamba)
Special Economic Zone
Calamba, Laguna

White Lily Industrial Park
Brgy. Pura & Tulo, Calamba, Laguna

Light Industry & Science Park III
Brgy. San Rafael & Sta. Ana, Anastacia, Sto. Tomas, Batangas

Sto. Tomas Batangas Ecozone
Brgy. San Rafael, Sta. Anastacia, Sto. Tomas, Batangas

First Philippine Industrial Park
Sto. Tomas, Tanauan, Batangas

Rancho Montana Ecozone
Brgy. Luyos, Sulopoc and Sulplang, Tanauan, Batangas

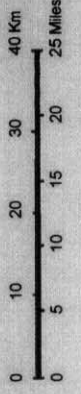
Lipa Technology Center
Lipa and Mahave, Batangas

RLC Special Economic Zone
Simlong, Batangas

Economic zones

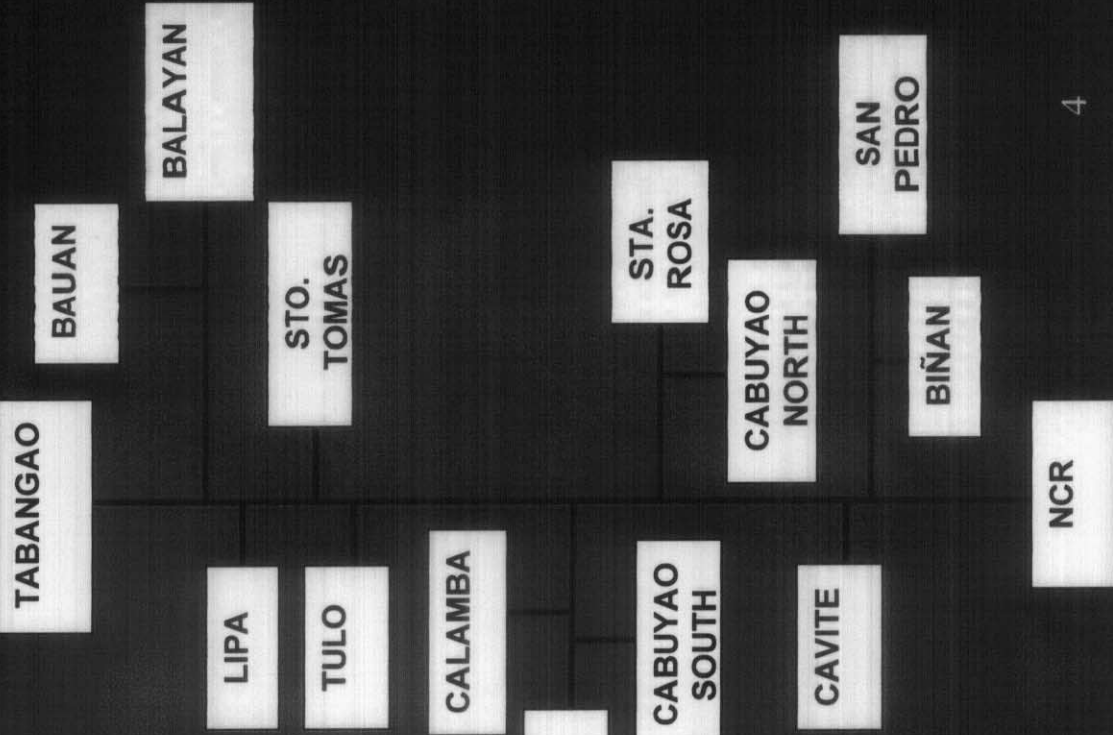
--- Provincial/City boundaries

Elevation





SOUTHERN LUZON TRANSMISSION DIAGRAM



TOTAL TRANSMISSION

PIPELINE LENGTH :

98.58 KM

MINIMUM INLET

PRESSURE : 60 BARS

MAXIMUM INLET

PRESSURE: 70 BARS

MINIMUM OUTLET

PRESSURE : 25 BARS

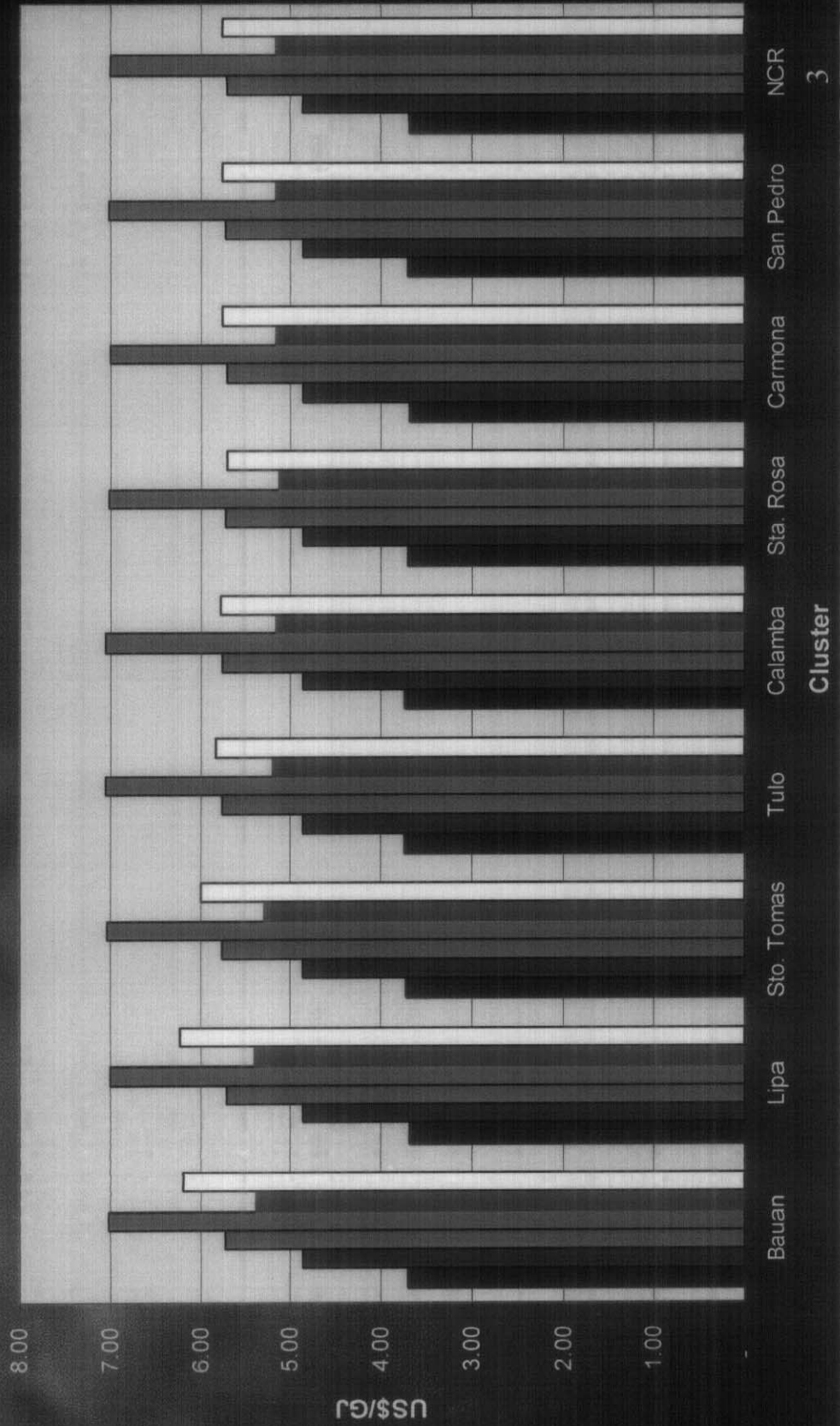
NOMINAL PIPE SIZE :

10 INCHES



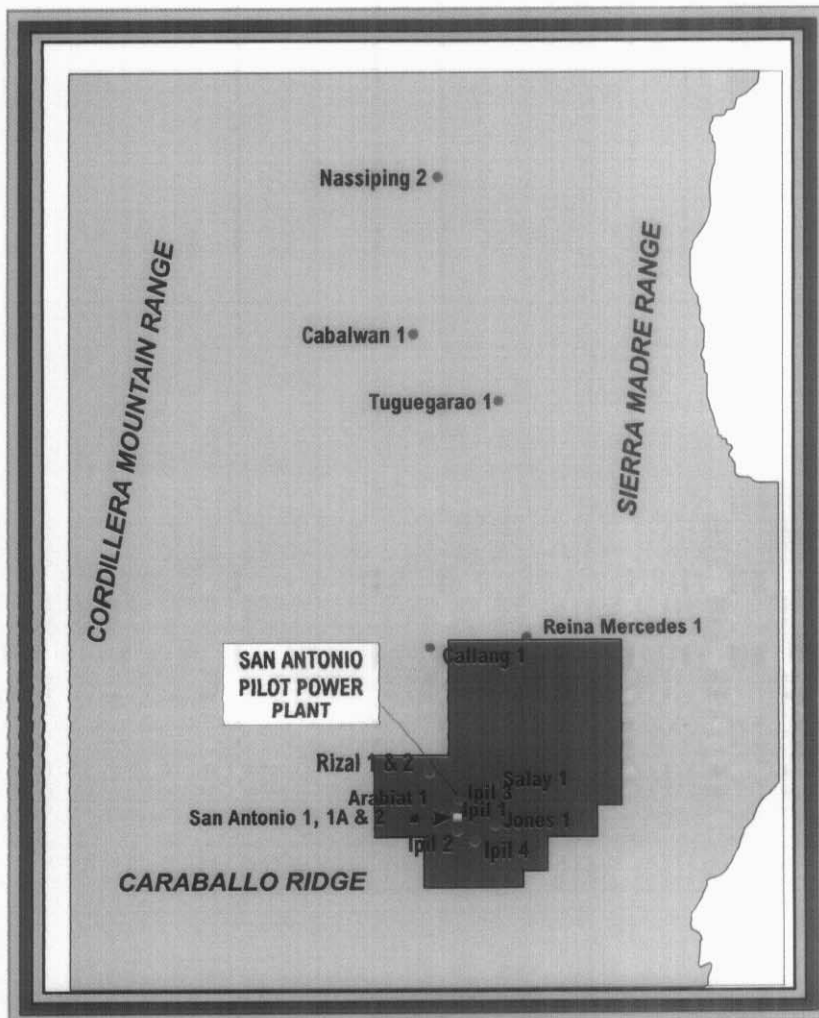
FUEL PRICE COMPARISON (NET COST, 2004)

Landed Cost Comparison



■ Fuel Oil ■ Kerosene ■ Diesel ■ LPG ■ Natural Gas w/ Financing (1% Interest p.a.) □ Natural Gas w/o financing

- PNOEC holds 100% interest.
- Carved out production area of 4,000 hectares within Service Contract 37 which expired July 18, 1997. PNOEC relinquished 98% or about 218,000 hectares.
- Granted a 25-year production license to expire July 18, 2022.
- Estimate of the reserves is at 4.3 BCF gas based on the downhole survey.
- Daily production is 1 MSCFD capable of generating 3 MW electricity.
- Three drillable prospects have been identified within the carved out area with a combined reserve potential of 9.8 BCF. The San Manuel-1 well has been proposed for drilling and the necessary drilling program prepared. An additional 4.68 BCF is expected to be added to San Antonio's gas reserves if the well is a discovery.



SOUTH CAGAYAN (SC 37)

- Two new structures were mapped in the Rizal-2 area and 7 kms. South of Santiago City interpreted to contain biogenic gas dissolved in water.
- These prospects are multi-target anticlinal plays involving three horizons younger than the Sicalao Lst. (San Antonio reservoir).
- Areal closure range from 22 kms² to 10 km².
- The Sicalao Lst. is not a prospective target where these new prospects are mapped.

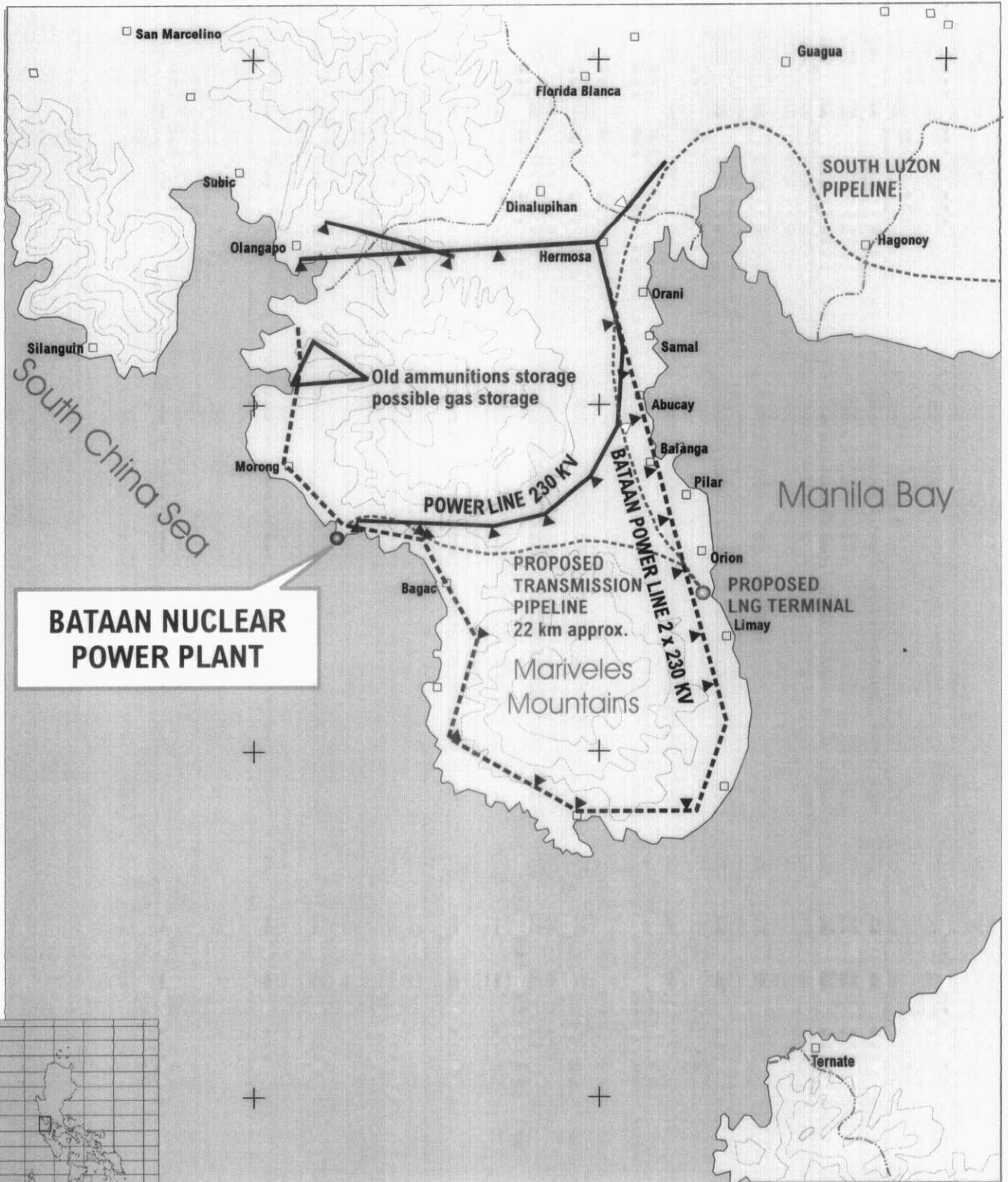
BRIEF ON THE PROPOSED BNPP CONVERSION

- > The Bataan Nuclear Power Plant, which was completed in 1984, has a rated power output of 600-MW. Essentially, early 1970s Westinghouse technologies are incorporated into the nuclear plant, but in the wake of the Three Mile Island accident, these have been modified to incorporate more recent safety devices.
- > To convert the BNPP facility to gas-firing using combined cycle technology, 1,000-MW of gas turbines will be installed as the primary generating units, in addition to the existing steam turbine generator (which will be downrated to 500-MW) as the secondary cycle, for a total installed capacity of 1,500-MW.
- > Budgetary estimates for the conversion amount to around US\$1 Billion (1994 prices), which excludes costs associated with upgrading the transmission line interconnection to the Luzon grid.
- > Conversion to gas-firing addresses several BNPP issues, including the continuing BNPP mothball costs and judicious utilization of existing BNPP assets.

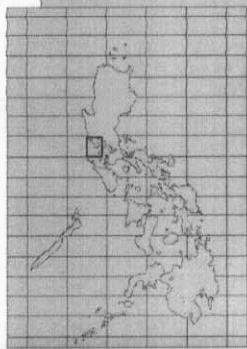
1994 studies compared three options for the repowering of the BNPP, as follows:

	GAS CONVERSION	COAL CONVERSION	NUCLEAR UPGRADE
POWER OUTPUT (MW)	1,700	800	620
CAPITAL COST (US\$MM)	1,385	1,070	300
CAPITAL COST (US\$/KW)	815	1,338	484
ELECTRICITY COST (cents/KWH)	4.81	5.57	3.25
CONSTRUCTION TIME (MONTHS)	24	48	18 to 24

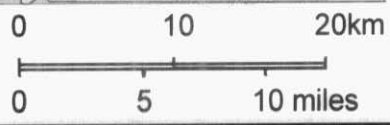
- > Capital costs and electricity generation from nuclear operation are considerably cheaper than for either coal or gas conversion option.
- > The nuclear upgrade (to 1990s standards) option will have to hurdle the prevailing sentiment against nuclear power, concerns regarding seismic safety, and political opposition.
- > Natural gas provides the cleanest option for the conversion to fossil fuel firing, in terms of pollutant emissions and extent of land area utilization.
- > Conversion of the BNPP into a major coal-fired power station on the western side of the Bataan peninsula may face local opposition and difficulty securing environmental acceptability. The coal conversion option requires 100% premium imported thermal coal as fuel.



BATAAN NUCLEAR POWER PLANT



PROPOSED BATAAN-SUBIC BAY
230 KV INTERCONNECTION
POWER LINE



BNPP INFRASTRUCTURE - PRESENT & PROPOSED

Petroleum Nasional (PETRONAS) SUBSIDIARIES

UPSTREAM

Petronas Carigali	5/11/78	Exploration, development & production of oil & gas in Malaysia
Petronas Carigali Overseas	4/12/90	Exploration, development & production of oil & gas overseas
Petronas Carigali (JDA)	3/4/94	Exploration, development & production of oil & gas in the Malaysia-Thailand Joint Development Area

DOWNSTREAM

Petronas Gas Supply (Labuan)	3/19/92	Supply of natural gas to bulk consumers in Labuan Island
Petronas Methanol (Labuan)	3/20/92	Production of methanol using natural gas as feedstock
MTBE Malaysia	3/31/89	Management & operation of the MTBE/propylene plant located in Kuantan, Pahang and marketing of its products
Petronas Fertilizer (Kedah)	1/6/83	Construction & operation of second ammonia/urea plant in Gurun, Kedah
Petronas NGV	2/14/95	Promoting & developing the use of natural gas as a commercially viable & clean transportation fuel
Petronas Penapisan (Terengganu)	3/3/82	Management & operation of a 40,000-Bbl/day refinery in Kertih, Terengganu
Petronas Penapisan (Melaka)	9/19/87	Management & operation of refinery in Melaka
Malaysia International Trading Corp. (MITCO)	1/28/82	Trading in fertilizers, chemicals, plastics, engineering parts & general merchandise
Petronas Trading Corp. (PETCO)	1/29/83	Trading internationally in non-indigenous crude, petroleum products & LPG
Petronas Tankers	1/29/83	Management & operation of LNG tankers
Petronas Maritime Services	6/4/92	Management & operation of ports & marine vessels. Provision of marine support services and consultancy services, including chartering of vessels for Petronas operating units
Petronas Research & Scientific Services (PRSS)	12/8/92	Research, consultancy & technology development in oil, gas & petrochemical industries
Petronas Management Training (PERMATA)	3/19/92	Provide training-related services & facilities (including training consultancy, conference & recreational facilities) to Petronas Group of Companies & external users
Petronas Hartabina	11/28/89	Property holding company of Petronas
Petronas Property Management Services	5/27/93	Provide property management services to Petronas Group of Companies and to manage Kertih Airport

Polypropylene Malaysia	3/31/89	Management & operation of a polypropylene plant as well as marketing the product (Partners: Idemitsu Petrochemicals 10%, Neste Oy 10%)
Petronas Gas	5/23/83	Processing & transmission of sales gas & products on behalf of Petronas
Petronas Dagangan	8/5/82	Marketing of petroleum products in the domestic market
Malaysia LNG (MLNG-1)	6/14/78	Management & operation of the LNG plant in Bintulu, Sarawak and marketing of LNG to buyers in Japan & other countries (Partners: Shell Gas 15%, Mitsubishi 15%)
ASEAN Bintulu Fertilizer	12/6/80	Operation of the ammonia/urea plant located in Bintulu, Sarawak, established under the ASEAN Industrial Projects Scheme (Partners: Indonesia 13%, Thailand 13%, Philippines NDC 9.5%, Singapore 1%)
Ethylene Malaysia	7/11/91	Production & marketing of ethylene in the domestic & export markets (Partners: BP Chemicals 15%, Idemitsu Petrochemicals 12.5%)
Gas District Cooling	7/19/93	Construction, ownership & operation of gas-fired district cooling plants for the commercial sector in Malaysia
Malaysia LNG Dua (MLNG-2)	6/1/92	Production & sale of LNG (Partners: Shell Gas 15%, Mitsubishi 15%)
OGP Technical Services	3/24/92	Provision of project management, engineering, procurement & construction management services for the oil, gas & petrochemical industries (Partner: Nova Gas 40%)
KLCC Holdings	1/30/89	Investment holding company (Shareholders: MAI Holdings, related companies, minority shareholders 50.5%)
Polyethylene Malaysia	7/11/91	Production & marketing of polyethylene in the domestic & export markets (Partner: BPCM Assets 60%)
Malaysia LNG Tiga (MLNG-3)	11/8/95	Production & sale of LNG (Partners: Shell Gas, Nippon Oil)

資料－7 Petroleum Service Contract Map

SERVICE CONTRACTS (SC):

- 6 - Philodrill Corp. (Offshore NW Palawan)
- 14 - Alcorn Production (Offshore NW Palawan)
- 37 - PNOOC-Explo. Corp. (Isabela, Cagayan Valley)
- 38 - Shell Phils. Explo. (Offshore NW Palawan)
- 40 - Forum Exploration (North Cebu)
- 41 - ARCO Philippines (Sulu Sea)
- 42 - Nido Petroleum (Offshore NW Palawan)

GEOPHYSICAL SURVEY & EXPLORATION CONTRACTS (GSEC):

- 73 - PNOOC-Exploration Corp. (Cotabato)
- 75 - Vulcan Industrial (Central Luzon)
- 76 - Globex Offshore (Ragay Gulf)
- 84 - PNOOC-Exploration Corp. (Babuyan Channel)
- 87 - Philodrill Corp. (Sibutu)
- 88 - PNOOC-Exploration Corp. (Offshore Mindoro)
- 89 - PetroEnergy Corp. (Agusan-Davao)
- 90 - Basic Consolidated (Lingayen Gulf)
- 91 - Shell Phils. Explo. (Offshore SW Palawan)
- 92 - Forum Exploration (Manila Bay/Cavite-Batangas)
- 93 - Alcorn Petroleum (East Visayan Sea)
- 94 - Trans-Asia Oil (Offshore W Palawan)
- 95 - Nido Petroleum (Offshore SW Palawan)
- 96 - Murphy Philippines (Offshore NE Palawan/Cuyo)
- 97 - Dragon (Far East) (Reed Bank)
- 98 - Philodrill Corp. (Mindoro)

NON-EXCLUSIVE GEOPHYSICAL PERMITS (NGP):

- Pacrim Energy - Central Luzon
- Trans-Asia Oil - Offshore W. Batangas/Tablas
- South China Resources - Offshore NE Palawan
- Pacrim Energy - South Cebu

PETROLEUM SERVICE CONTRACT MAP

As of January 14, 2000



VERTICAL DISTORTION
CLASS II SURVEYS
ADAPTED FROM THE U.S. NAVY SERVICE SURVEY CENTER

LEGEND:

- Service Contracts
- Geophysical Survey Exploration Contracts (GSEC)
- GSEC Under Application
- Non-exclusive Geophysical Permits
- Water Depths of 200 meters and less
- Sedimentary Basin

WELL LEGEND:

- Producing Oil Well
- Producing Gas Well
- Gas Well, P & A
- Oil Well, P & A
- Oil & Gas Well, P & A
- Dry Hole with Gas Shows, P & A
- Dry Hole with Oil Shows, P & A
- Dry Hole with Oil & Gas Shows, P & A
- Well, No Shows, P & A
- Well Drilling On-going/Programmed

