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SUMMARY OF THE INTERNATIONAL WORKSHOP ON OPPORTUNITIES FOR PRIVATE SECTOR POWER GENERATION IN INDONESIA

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Jakarta, Indonesia

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

As in most developing countries, power supply projects in Indonesia are undertaken to meet both economic and social objectives, and are largely the responsibility of the government. Indonesia's National Guidelines for State Policy (Garis Besar Haluan Negara - - GBHN, 1988) state that "electric power development shall be continued and accelerated to promote economic and social welfare, in the urban as well as rural areas. Rural electrification shall be continued to stimulate economic activities and to enhance the intellect and welfare of people in the rural areas." To meet the government's electrification objectives, PLN, the state-owned electric utility, has expanded its generation capacity from 536 MW in 1968/69 to 8,814 MW in 1989, representing an average annual growth of over 14 percent. However, since PLN does not meet all power requirements of the country, a large number of industries have installed their own captive power plants which by 1989 roughly equaled the generation capacity of PLN.

During the early years of the Fourth Five-Year National Development Plan (REPELITA IV, 1984-1989) the Government of Indonesia (GOI) realized that the rate of growth of power demand was exceeding PLN's ability to construct new generating capacity. At the same time, Indonesia was experiencing a sharp decline in foreign exchange earnings from reduced oil and gas exports. With these constraints in mind, the Government of Indonesia opened the possibility for the private sector and cooperatives to participate in power supply. The basis for private investment in the power sector is established in Law No. 15 of 1985. The law states:

> In an effort to meet power needs in a more equal manner and to further improve the capability of the Government to provide power as referred to in Article 6 paragraph (2), for public use as well as own use, insofar as the interests of the Government are not harmed, the widest possible opportunity shall be given to cooperatives and other enterprises to provide power base on the Power Enterprise Permit. [Law 15/1985, Article 7, paragraph 2.]

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In areas where PLN is already operating but is unable to fulfill demand, the private sector can participate in power generation but must sell its power to PLN. In areas where PLN is not operating, the private sector can generate power to meet its own needs, and may also provide electricity directly to the public, under license.

In 1988, at the request of the Government of Indonesia and with funding provided by the U.S. Agency for International Development (USAID), a team of consultants conducted a study of the opportunities for and impediments to private sector power generation in Indonesia.[1] The study team found that private investment in the power sector, if properly planned and managed, could be of significant benefit to Indonesia. Increased overall energy and economic efficiency of the power system, reduced local currency and foreign exchange burdens to the national treasury, and accelerated electrification of rural areas were among the potential benefits to be realized from a private power program. The study recommended that a national workshop be held on private power generation to give greater attention to the prospects for private sector participation and to create a more active flow of information among the government, potential investors, entrepreneurs, and the financial community.

1.2 PRIVATE POWER WORKSHOP

Following the recommendation of this study, the International Workshop on Opportunities for Private Sector Power Generation in Indonesia was held in Jakarta during March 6-8, 1989. The workshop was sponsored by three organizations: the Directorate General of Electric Power and New Energy in the Ministry of Mines and Energy, the Agency for Assessment and Application of Technology (BPPT), and the U.S. Agency for International Development. USAID's support was provided jointly by the Office of Energy (the Bureau for Science and Technology) and the Bureau for Asia and the Near East under the Energy Conservation Services Program (ECSP). RCG/Hagler, Bailly, the ECSP contractor, was

[1] Energy/Development International, *Private Sector Power Generation in Indonesia: Opportunities and Impediments.* Washington, D.C.: March 1988.

responsible for organizing the conference and was assisted by the Commercial Office of the U.S. Embassy in Jakarta. The workshop agenda is attached as Appendix A.

The objectives of the workshop were to:

- discuss and evaluate Indonesia's power situation, including supply and demand projections, the financial and investment situation, and policy and institutional factors that affect private power development;
- examine other countries' experiences with private sector power and relate them to Indonesia's experiences and opportunities; and
- examine private sector views and key institutional and technical issues necessary for the development of an Indonesian private sector program with regard to Law No. 15 of 1985.

The workshop was opened by Major General T.B. Silalahi, director general of the Ministry of Mines and Energy, and Hon. Paul J. Wolfowitz, U.S. ambassador to Indonesia. Speakers at the conference included State Minister of Research and Technology B.J. Habibie, President Director of PLN Ermansyah Jamin, Chairman of the Investment Coordinating Board Edi Sanyoto Sastrowardoyo, and other representatives of the Government of Indonesia. They were joined by speakers from the U.S. public and private sectors, the National Power Corporation of the Philippines, and the Asian Development Bank, among others.

The workshop drew over 200 participants from the Indonesian governmental agencies responsible for energy, electric power and industry, as well as major Indonesian and U.S. industrial entities and financial institutions. A list of participants is attached as Appendix B.

CHAPTER 2: SUMMARY OF WORKSHOP PRESENTATIONS

Rather than summarize each of the papers presented at the workshop, in this chapter, the experiences and ideas of the workshop participants have been organized conceptually and grouped into five major areas. Section 2.1 summarizes the discussion of the power situation in Indonesia. Section 2.2 describes the experiences of other countries with private power development. Section 2.3 examines issues related to private power in Indonesia. Section 2.4 identifies power supply opportunities for Indonesia, and finally, Section 2.5 summarizes the activities of international development organizations in support of private power. The statements made in this chapter are solely based on the papers presented in this conference. Copies of these papers are available on request.

2.1 THE POWER SITUATION IN INDONESIA

This section summarizes the current energy and power situation in Indonesia as was described in presentations by Mr. Djurzan Hamid of the Ministry of Mines and Energy and Mr. Ermansyah Jamin of PLN.

Energy and Electricity Policy

According to a speaker from the Ministry of Mines and Energy, Indonesia's national energy policy has two primary objectives: 1) to secure a supply of energy for domestic use at affordable prices, and 2) to secure a supply of energy that is adequate for export as a source of foreign exchange. The government has adopted specific policies to increase energy supply and expand the exploration of energy sources, diversify away from petroleum, conserve energy and use energy efficiently and wisely, and match energy needs with the most appropriate sources available.

The Indonesian government views electricity development as an integral part of national development. In particular, the government promotes electrification to spread development to rural areas. Furthermore, it is the government's intention to maximize the utilization of domestic products and services in developing the country's electricity network. Finally,

electricity development must comply with environmental policies to conserve Indonesia's natural resources.

Law No. 15 of 1985 states that the objective of "electric power development shall be to provide supply and services of electric energy continuously and evenly throughout the country, with adequate quality and reliability, in adequate quantity, and at prices affordable to the public. The price of electricity shall be determined and controlled by the government."

Generating Capacity and Sales

According to a PLN speaker, PLN's generating capacity has grown steadily over the last two decades (1968/1969 - 1987/1988). During REPELITA I-III (1969-1984), PLN's installed capacity increased an average of 14.8 percent per year. Expansion has continued during REPELITA IV (1984-1989). PLN's generating capacity increased over this period from 4,515.3 MW to 8,814.2 MW, at an average annual increase of 17.5 percent. PLN has plans to install an additional 3,695 MW of capacity during REPELITA V (1989-1994).

PLN Capacity Expansion Plan for REPELITA V

	Megawatts (MW)	% of Total
Coal-fired steam	1,460.0	39.5
Combined cycle	1,120.0	30.3
Geothermal	290.0	7.9
Hydroelectric	285.5	7.7
Diesel	248.5	6.7
Gas turbines	137.0	3.7
Gas-fired steam	130.0	3.5
Microhydro	24.0	0.7
TOTAL	3,695.0	100.0

Source: PLN

Electricity sales increased 15.2 percent per year, on average, between 1969 and 1984. From 1984/85 to 1987/88, sales grew from 11,039.3 GWh to 17,076.8 GWh, an average annual increase of 15.6 percent. Sales are expected to reach 20,105.6 GWh in 1988/1989. PLN

anticipates sales at the end of REPELITA V (1994) to be 38,851 GWh, representing an average annual increase of 14.4 percent from current levels.

Total PLN customers increased from 5,133,231 in 1984/85 to 9,616,450 in 1988/89, showing an average annual growth of 16.9 percent. During REPELITA V, PLN expects to serve an additional 5,894,000 customers, bringing the total to 15 million by 1994.

Transmission Network

During REPELITA I-III, the average annual increase in the installed high voltage network was 25.5 percent; in the medium voltage network it was 15.8 percent; and in the low voltage network it was 11.4 percent. The high voltage network increased from 11,415.5 kmc. (circuit kilometers) to 15,767.9 kmc. during REPELITA IV, an average annual increase of 8.2 percent. The medium voltage network increased from 31,876 kmc. to 61,707.7 kmc. over this period, for an average annual growth rate of 17.4 percent. The low voltage network grew from 54,913.7 kmc. to 106,530.4 kmc., an average increase of 16 percent per year. During REPELITA V, PLN plans to add 6,574 kmc. of high voltage lines, 51,652 kmc. of medium voltage lines, and 74,848 kmc. of low voltage lines.

Rural Electrification

The electrification of rural villages increased from 3.4 percent at the beginning of REPELITA I to 12.6 percent at the end of REPELITA III, an average annual increase of 9.2 percent. By the end of REPELITA IV, it is expected that 26.8 percent of the nation's rural villages will be electrified. The number of new villages electrified is now 18,273, up from just over 1,500 when PLN's rural electrification program began in 1974/1975. Approximately 9,100 new villages will be tied to the grid during REPELITA V, reaching a total of 27,500 by 1994.

Future Power Supply Requirements

By the year 2005 Indonesia will need an additional 17,000 MW of generation capacity nationwide; of this, 13,000 MW will be installed on Java. A total of 27,000 MW of additional capacity will be needed by 2015 for the island of Java alone.

In terms of resource options, the government's preferences for future development are: 1) hydropower, 2) geothermal, 3) coal, 4) natural gas, 5) oil, and 6) others, including nuclear. Hydro resources will be fully exploited in a short time; the country's geothermal resources are limited; coal presents environmental problems; the government would rather export domestic oil and gas than use it for power generation; and non-conventional resource options are currently viable only in special and remote areas. This leaves the government with the sense that nuclear power is an eventuality.

According to one PLN speaker, PLN faces a number of social, operational and economic/financial problems in meeting Indonesia's electricity needs. The power sector's funding requirements during REPELITA V are estimated to total Rp. 19,678 billion (US $11.2 billion).[3] Financing this expansion is problematic. PLN's self-financing capabilities are insufficient as a result of low tariff levels, an inability on the part of the government to provide financing equity, and an inability to borrow due to the government's current debt service levels. This situation is exacerbated by the foreign exchange risks associated with appreciating currencies. In addition, PLN faces problems regarding land use restrictions and compensation for land use, and the growing awareness by the government and the public regarding the environmental impacts of new power plants.

Indonesia has unique geographic conditions affecting its available power supply options. Because its population is widely dispersed, a decentralized power supply approach with only a limited number of interconnected power systems has been adopted, and, therefore, higher operating costs are inevitable. Other problems include the need for improvements in

[3] Although figures are not available for the REPELITA V development budget, the power sector accounted for 12 percent of the development budget during REPELITA IV.

operating efficiencies, particularly in transmission and distribution network; lack of an effective pricing policy to support diversification of the power supply; an increased number of captive plants due to a lack of adequate service (oil consumption by these captive plants would offset gains already made in fuel diversity); and continued dependence on foreign funds, equipment, materials and services.

According to a conference speaker, PLN's operations on Java are now near financial breakeven, offering little or no return on assets. Its operations off-Java suffer heavy financial losses, estimated at about $100 million per year. PLN's average generation cost is Rp. 95/kWh (5.6 cents/kWh), while the utility's electric power tariffs have been fixed at Rp. 50/kWh (2.8 cents/kWh since August 1986, well below the long-run marginal cost of supply).

2.2 PRIVATE POWER DEVELOPMENT IN OTHER COUNTRIES

This section presents the experiences of ten countries with the development of private power and is based on presentations by Elaine Evans of the National Hydropower Association, Eric Woychik of the California Public Utilities Commission, James Harral of Pacific Gas and Electric Company, John Kadyzewski of USAID, Deogracias Peralta of the Philippines National Power Corporation, and Pirooz Sharafi of RCG/Hagler, Bailly. These experiences can provide valuable insights for Indonesia and other countries interested in exploring private power supply alternatives.

United States

In the United States, the Public Utility Regulatory Policies Act (PURPA) of 1978 mandates that utilities purchase power from the unregulated producers in their service territory. This law has had the effect of removing important regulatory burdens on non-utility power producers. It was supplemented with a variety of investment incentives in the form of tax credits and rapid depreciation of plants and equipment. It was a program that depended on a responsive capital market in order to work, and it spawned a new independent energy

industry in the United States. The experiences of two states, California and Hawaii, since the enactment of this law, are described below.

California

California's experience with PURPA and private power is unique. Following enactment of PURPA, the California Public Utilities Commission developed a series of standard contracts to be used by private power developers who wanted to sell power to the utility grid. These contracts were established in response to concerns over unfair negotiation between the developers and the utilities.

California's program has been successful in attracting a large and diverse array of private power developers. As of September 1988, 6,040 MW of private generation were on line and an additional 15,703 MW were contracted with the state's three major electric utilities. Of the projects on line, 3,514 MW are provided by cogeneration, 1,400 MW by wind, 452 MW by biomass, 145 MW by solar, 177 MW by hydropower, and 24 MW by geothermal. A total of 1,221 projects were on line at the end of 1988, with an average capacity of 4.2 MW. California has two thirds of the U.S. private (PURPA qualifying facility) power generation capacity and more than 95 percent of the nation's wind and geothermal development.[4] Private developers are expected to meet the state's electricity growth needs through the 1990s.

California has recognized a number of benefits from its private power program. These include: increased diversity in fuel sources, operational characteristics, location and size; increased reliability resulting from many small increments versus one single power plant; the capability of adding new supply in small increments to avoid the "lumpiness" of traditional capacity additions; and the ability to site projects closer to load centers. California has also been able to shift much of the risk of construction cost overruns and

[4] Qualifying facilities under PURPA are small power producers (solar, wind, hydro, biomass, municipal solid waste, and geothermal) and cogenerators that meet certain requirements (e.g., a minimum heat rate and the use of a given amount of waste heat) in order to sell power to utilities.

plant completion delays to the project's developers, leaving ratepayers to pay only for the power they actually receive.

Electric utilities have experienced major changes in their supply strategy resulting from PURPA as well. Pacific, Gas and Electric (PG&E), California's largest investor-owned utility, with current installed generating capacity of 16,000 MW and 4 million customers, for example, received 10 percent of its total energy sales from PURPA qualifying facilities (QFs) in 1987. In that year, PG&E had contracts with 800 projects for over 9000 MW of capacity, of which 2275 MW were operational.

There have been some significant benefits for PG&E of QF purchases. QF power has resulted in an expanded capital resource base, freed the utility's capital for the care and maintenance of the system, created an impetus for new technologies, increased diversity, and improved the stability of power supply. In addition, competition among third parties has resulted in economically efficient pricing. The utility has been able to minimize its own construction and operation costs, and the cost and risk burden has shifted from utilities to the new generation entities. QFs also maintain operations in system emergencies, thus stabilizing the utility's voltage and frequency.

On the other hand, there have been some negative aspects of private power development for PG&E. Non-utility sources have brought on new capacity that results in lower capacity factors for utility-owned power plants. This has resulted in unnecessary power purchases. There has also been a problem with inaccurately calculated avoided cost. Last, the program has created opportunities for industrial customers to bypass the utility's service, affecting both PG&E's planned and operating capacity levels.

Hawaii

In Hawaii, the major suppliers of non-utility power under PURPA have been the state's sugar mills. Approximately 10 percent of the annual electricity production statewide, and between 29 and 63 percent of the power for Hawaii's outer islands, comes from this industry. Total annual electricity production in Hawaii during 1988 was 8,150 GWh. About

90 percent of the energy produced by the state's sugar mills comes from bagasse (the fibrous byproduct of milled sugarcane), the remainder coming from small-scale hydropower stations.

Ten years ago, Hawaii's sugar mills produced energy from sugar cane wastes as a source of supply for meeting the industry's own needs. Then a period of transition began, in which sugar mills provided Hawaii's utilities with "dump" (surplus) power and later with baseload generation. Today, Hawaii's sugar mills produce 815 GWh annually and have an installed capacity of 213 MW. The largest of these plants is 40 MW; the smallest is 2 MW. Six mills provide firm power, while the others provide power on an unscheduled basis. Electricity sales represent 10 percent of the annual net revenues for the sugar industry.

Pakistan

In Pakistan, the Water and Power Development Authority (the national utility) was able to achieve only 50 percent of its planned capacity expansion during the Sixth Five-Year Plan (1982-1987). In 1985, the Ministry of Water and Power announced a new policy to induce the private sector into power generation (plants fueled by domestic coal or imported oil only). Under this policy, private sector entities would be allowed to invest in power projects and sell electricity to the national utility. The private sector is required to have a minimum of 25 percent equity participation in such projects. While these projects were treated as industrial entities and enjoyed certain investment incentives, the private sector was to assume the operational risks and earn a return that was not guaranteed. The government would only guarantee to buy electricity at an average capacity factor of 60 percent.

The Government of Pakistan has set an ambitious goal for its Seventh Five-Year Plan (1988-1992): that the private sector should have in place 2,300 MW of generating capacity (35 percent of the total expected capacity additions for this period). The largest of these projects is a 1,200 MW oil-fired power plant proposed by a British-Saudi Arabian joint venture. To assist the Government of Pakistan with this effort, the World Bank has developed a private sector energy fund in conjunction with other multi-lateral agencies. (In addition to the World Bank, other contributors to the fund include USAID, the Japanese

Export-Import Bank, British ODA, Italy and West Germany.) The fund will provide $550 million to lend up to 30 percent of private power project costs.

Philippines

Before 1972, the Philippine power industry was composed of a few large and many small utilities. In November 1972, the government made the country's total electrification a national objective and mandated that the National Power Corporation (NPC) set up power grids all over the country. In January 1987, President Aquino signed Executive Order No. 215. While the NPC was still given responsibility for developing the nation's power system, this Executive Order also allows and encourages private sector participation in power generation.

The government changed its national energy policy for three reasons: 1) the public investment requirements for the energy sector were expected to remain high, 2) the private sector was thought to be more efficient and able to provide electricity at lower costs, and 3) it was projected that the private sector might accelerate the development of small-scale renewable energy and cogeneration facilities. The NPC has developed draft rules and regulations to implement Executive Order 215, and the Office of Energy Affairs plans to finalize the rules in June 1989. The NPC has also indicated its interest in considering private sector proposals to develop its expansion plan, which includes a 200 MW gas turbine project in Luzon and a 300 MW coal-fired plant in Calacca.

At least one project, a 200 MW gas turbine sponsored by Hopewell (Hong Kong) has reached contractual arrangements with NPC on a build-operate-transfer (BOT) basis. The project will operate for 12 years before being transferred to the NPC. Financing for this US $41 million project, will involve the Asian Development Bank and the International Finance Corporation as both lenders and equity holders, as well as commercial banks. In addition, Cogentrix (U.S.) has proposed building a 220 MW coal-fired cogeneration project at an oil refinery and selling excess electricity to NPC.

India

During India's Eighth Five-Year Development Plan (1990-1995), the government is planning to allow the private sector to build 2,000 MW of new generating capacity representing over 20 percent of new generation capacity requirements. A joint public-private sector committee recently made recommendations to encourage private sector investment, including an increase in the debt to equity ratio from 3:1 to 4:1, an increase in the allowable rate of return on power investments from 12 percent to 15 percent, capitalization during construction, and longer durations for power generation licenses.

A few of the private utilities operating in India are planning to expand their generating capacity (e.g., Tata Electric Company, Bombay Suburban Electric Supply Company, Ahmedabad Electric Co.). There are also a number of industrial plants that are selling excess power to the state electricity boards, and a number of large investment houses in India are considering investing in power supply sources. Industrial entities are joining together to build power plants (i.e., captive collective projects) in order to meet part of their own power needs using the utility grid for wheeling electricity to their respective sites.

Malaysia

In its drive to cut public spending, the Government of Malaysia has encouraged private sector investment in public sector projects. The government is close to completing a privatization master plan to streamline this process. It has earmarked a number of infrastructure projects and industries for privatization, including the state-owned National Electricity Board.

The government has awarded a M $80 million (US $30 million) power interconnection project to LBI Private, Ltd., a local privately-owned joint venture. LBI will finance, build, own, and operate two electrical substations and an 85 km power line between the small island of Labuan and the Malaysian state of Sabah on the island of Borneo. After operating the project for 15 years, the company will turn over the facility to the government at no charge.

Thailand

The National Energy Policy Office of Thailand is developing guidelines for industrial cogeneration and sale to the grid. There are a few projects under development, such as the National Petrochemical Corporation's 55 MW cogeneration plant. This plant will sell excess electricity to EGAT (the Electric Generating Authority of Thailand). In addition, the Government of Thailand is developing a cogeneration project at the Nongkyai Sugar Mill, financed in part by USAID.

A 1986 market assessment identified over 1200 MW of private power potential in Thailand.[5] Most of the potential identified was in cogeneration and agro-industrial waste power systems. Thailand's total generation expansion need through 1996 is 6200 MW.

Costa Rica

Costa Rica's National Energy Plan, which was approved in 1987, specifically states that privately financed power generation initiatives will be considered. The legal and institutional aspects of private power have been discussed within the Ministry of Natural Resources, Energy and Mines. Already, a number of private power projects are being considered by the government, including several mini-hydro projects totalling approximately 35 MW, sugar mill cogeneration projects, and a 12 MW waste-to-energy project.

The growth of private power development in Costa Rica depends, in part, on government initiatives to provide incentives to private power producers A study conducted by USAID found that with effective policies and initiatives, there is a potential market for 443 MW of power generation capacity in Costa Rica (this is about 60 percent of the nation's current

[5] RCG/Hagler, Bailly, Inc., *Private Sector Small Scale Power Generation in Thailand: Potential, Impediments, and Policy Issues*. Prepared for the U.S. Agency for International Development, November 1986.

installed capacity).[6] The bulk of this capacity would come from hydropower and cogeneration, mainly from sugar processing wastes.

Dominican Republic

Faced with severe shortages of electricity and an inefficient national utility, the Government of the Dominican Republic has introduced a bill that should establish guidelines for private sector participation in electricity sale and generation. CDE, the national electric utility, is already purchasing power from the Falconbridge Mining Company, which operates a 198 MW powerplant. Other private and state enterprises generate another 136 MW for their own use and/or sale to the national grid.

Several proposals for power generation have been submitted to the government for review in response to a Presidential Emergency Power Decree. These include a 300 MW powerplant, to be constructed on BOT terms by Ontario Hydro (Canada), and 128 MW diesel plant proposed by IEMCA, a local private company.

Turkey

The Government of Turkey passed a law in 1984 which granted permission to entities other than the Turkish Electric Authority (TEK) to construct and operate power plants. Regulations allowing private power were introduced in 1986. Under these regulations, the government states that new power generation will be privately financed, that BOT projects for foreign investors will be encouraged, and that the national utility will lease existing transmission, distribution, and generation to customers and regional utilities.

At least nine private companies (some in joint ventures with foreign concerns) are in the process of establishing their own electric plants. TEK will purchase the power from these

[6] RCG/Hagler, Bailly, Inc., *Non-Utility Power Generation in Costa Rica: Potential Impediments and Policy Issues.* Prepared for the U.S. Agency for International Development, April 1988.

plants. In particular, the government is currently negotiating with a Westinghouse (U.S.)-Chiyoda (Japan) joint venture for a BOT-type, 1400 MW thermal power plant.

People's Republic of China

Although there is no official policy on private sector participation in power supply in the People's Republic of China (PRC), a 700 MW coal-fired power plant has been operating in Guadong Province since early 1988. The plant, known as Shajian "B," was built as a joint venture between Hopewell Power Ltd. (Hong Kong) and the Shenzhen Special Economic Development Group Ltd. This HK $4 billion (U.S. $512 million) project is notable in that it is the world's first operational BOT power project.

According to Avinder Bindra of Citicorp, Hopewell Power Ltd. will earn all the revenues in excess of project costs during the concession period (first 10 years). After that time, the operation of the joint venture will cease and the Shenzhen Special Economic Development Group Ltd. will own and operate the power plant.

2.3 ISSUES RELATED TO PRIVATE POWER IN INDONESIA

In this section, we summarize the remarks made by B.J. Habibi, State Minister for Research and Technology; Ermansyah Jamin, President Director of PLN; Moh. Mochtar Wiryosaputro of the Ministry of Mines and Energy; Edi Sanyoto Sastrowardoyo of the Investment Coordinating Board; Vladimir Bohun of the Asian Development Bank; Gregory Churchill of the law firm of Ali Brdjardjo, Nugroho, Reksodiputro; David Keith of RCG/Hagler, Bailly; and Harvey Salgo of Energy Systems Research Group; on economic, financial, regulatory, institutional, and pricing issues related to private power development in Indonesia.

Government Economic Policies

The Government of Indonesia's economic policies for REPELITA V (1989-1994) contains three major directions. First, monetary and budgetary policies will be closely controlled.

In this regard, the government has set a goal of limiting inflation to 5 percent per year. Public debt will be held to commonly accepted limits expressed by the debt service to export earnings ratio. Second, realistic exchange rates will be maintained. Sharp and sudden fluctuations in the value of the rupiah will be avoided, and freedom from foreign exchange controls will be maintained. Third, the government will continue to deregulate the economy and reduce bureaucratic obstacles to all types of business entities: small as well as large, foreign as well as domestic, and private businesses as well as cooperatives and government-owned enterprises. The government will make efforts to reduce the costs of doing business, maintain a low-cost economy, and increase business efficiency while striving to achieve an equitable income distribution and maintain social solidarity.

One of the goals of REPELITA V is to reduce foreign borrowing so that the country's debt service does not exceed 25 percent of export earnings (Indonesia's current rate is 35 percent). In that light, the government is cautious about projects that entail foreign borrowing and which could lead to future financial resource outflows that exceed the desired debt service level. Build, own and transfer (BOT), build, own and operate (BOO) and build, own, operate and transfer (BOOT) projects are also viewed cautiously because they could lead to unacceptable financial outflows. For this reason, the government would favor economically productive private power projects that maximize the local content of foreign private BOT investments. Therefore, according to senior government representatives at the conference, BOT arrangements for infrastructure projects would be acceptable because they could lead to a low cost of doing business in Indonesia, thus increasing the competitiveness of Indonesian products on the export market.

A number of speakers also stressed the government's concern over the impact of private power on electricity tariffs. One speaker from PLN, for example, noted that as a matter of government policy and in pursuit of social and economic objectives, PLN provides incentives to certain sectors (e.g., special tariff rates for rural electrification). These incentives are financed indirectly through the more profitable areas of PLN's operations. Proliferation of private generation may, therefore, have adverse impacts on electricity tariffs. For example, cogeneration and captive generation by industry will exert upward pressure on tariffs by removing a lucrative segment of the utility's market. The BOT/BOO concept

may lead to lower tariffs during the implementation period of a private sector project as a result of reduced self-financing requirements for the utility. However, the higher return and financing cost and shorter amortization period of a private sector project may push tariffs upwards during the period of its operation, unless tariffs are offset by higher plant operating efficiencies.

Legal Aspects of Private Power Development

The Indonesian laws governing the generation and sale of electric power are based on Article 33 of the Indonesian Constitution (1945), which states that:

> (1) the economy shall be organized as a cooperative effort.., (2) branches of production essential to the State and governing the life and living of the public shall be controlled by the State, (3) land and water and natural riches contained therein shall be controlled by the State and used for the greatest possible prosperity of the people.

Although Law No. 15 of 1985 defines a number of parties who can be involved in electric power activities, the elucidation of the law makes it clear that electric power is an activity controlled by the government. In order to ensure compliance with this mandate, Law No. 15 contemplates a significant role for the government in the supervision and guidance of electric power companies, as well as in setting tariffs.

Article 2 of Law No. 15 states that electric power activities must foster the preservation and conservation of the environment and article 4(2) states that the natural resources that constitute sources of energy found in Indonesia must be exploited in a secure, balanced and ecologically sound manner (including coal, oil and natural gas, radioactive minerals, water, geothermal, solar, wind, ocean thermal, wood, plants, biomass, and animal by-products).

The Government of Indonesia enacted Law No. 4 of 1982 on environmental protection and, in 1986, issued requirements for environmental impact analyses as part of development and investment decisions. Further elaboration and stricter rules on environmental protection can be expected in coming years. Any private activity in electric power generation must pay

particular attention to the constraints imposed by Indonesia's need to strike a balance among conflicting uses for its resources and the 1982 law on the environment.

Law No. 15 of 1985 authorizes private industry or cooperatives to take part in the business of power generation, transmission, or distribution, or a combination of these, as long as the undertaking does not harm the state. Law No. 15 grants right of way authority to both state enterprises and licensed private companies. The Basic Agrarian Law (No. 5 of 1960) requires just compensation to those affected by the right of way. A company's failure to meet its obligations to the owners of land, buildings or trees that are used, crossed or damaged by electric power company activities is punishable by one year in prison or a fine of at most Rp. 10,000,000 ($5,700).

The unauthorized supply of electric power to third parties, i.e., without the Grant of Authority or the License and not for one's own use, is a felony punishable by six years in prison or a fine of at most Rp. 50,000,000 ($28,400). A license to generate electricity can be revoked if the state enterprise or licensed private company fails to meet its obligations for good service, work safety, and public safety. Under Indonesian law, if a company is found to be guilty of a criminal act, the penalties may be imposed upon the directors of the company.

Regulatory and Institutional Framework

According to speakers from the Ministry of Mines and Energy, the basis for electric power regulation in Indonesia can be traced back to the nationalization of independent and scattered private companies and the formation of PLN. National regulations No. 18 (1972), 36 (1979), 54 (1981) and 3 (1983) became the rules governing the formation of enterprises providing electric service to the pubic.

Law No. 15 of 1985 included provisions for government regulatory authority over electricity undertakings. An electricity undertaking, as defined in this law, is any activity dealing with the supply of electric energy and any supporting work required in association with the undertaking such as design, construction, maintenance, and technological development.

There are two government decrees related to participation in the power sector:

- Electricity Undertaking Authorization. This authorization is granted to a state-owned enterprise, exclusively assigned to implement the task of supplying electricity for public use and to perform electric power support work (PKUK). PLN is the only holder of a PKUK.

- Electricity Undertaking License. This permit is issued to a cooperative body or private concern to supply electric energy for public use (IUKU), or to a cooperative body, private concern, or a state-owned undertaking or state-owned institution, to supply electric energy for its own use (IUKS).

IUKU and IUKS are issued by the Ministry of Mines and Energy through the Directorate General of Electricity and New Energy. There are two types of IUKS with regard to power generating facilities. The first is for primary use, where the facility owner relies on the facility to meet its own power needs. An IUKS of this type can be granted even in areas serviced by PLN. The second type of IUKS is for emergency use, where the facility owner relies primarily on PLN sources of supply and uses its own facility in cases of power cutoff from the grid.

In areas where PLN has accessible service, electricity sales to the public should principally be made only by PLN. However, cooperatives can serve the public through their own distribution network by drawing on PLN sources of supply. A private entity can sell "bulk electric energy" to PLN, either from power facilities specially planned and built for the purposes of backing up PLN or from excess power generated by an IUKS holder. Excess power from a government institution holding an IUKS can be sold to the public through a cooperative or sold to PLN. In areas where PLN is unable to supply power, IUKU or IUKS holders can provide the service directly to the public.

Private Investment in the Power Sector

One speaker from the Investment Coordinating Board (BKPM) described the Government of Indonesia's investment policies as they relate to the power sector. The List of Investment Priorities (Daftar Skala Prioritas--DSP) of 1987 includes many facets of electric power development. Electric power supply projects, including generation from petroleum,

natural gas, coal, geothermal or hydropower, as well as transmission and distribution, are listed as open to both foreign and domestic investment. The generation of electric power from new or renewable sources of energy such as biomass, dendrothermal farms, mini- or micro-hydro, solar power, wind power, or radioactive minerals, is also open to both foreign and domestic investment.

Both local and foreign investors are sought for electric power support activities such as consulting and contracting. Foreign investment is sought for study and survey activities, the preparation of feasibility studies, and the preparation of design and engineering documents, so long as the investment comprises all of these services and is conducted in cooperation with an Indonesian consulting firm. Foreign investment in contracting must be conducted in cooperation with a national contracting firm and is reserved for transmission or transformer stations over 150 kV and for generation other than diesel, and mini- or micro-hydro. Foreign investment is also sought for manufacturing in such areas as high-voltage transmission cables, circuit breakers, compressors and gas turbines.

Investments are governed by the Foreign Investment Law of 1967 and the Domestic Investment Law of 1968. In 1984, the government introduced deregulation and debureaucratization policies to stimulate foreign investment in Indonesia. Current investment policies require that foreign direct investment be made in the form of a joint venture between foreign and local partners upon receipt of government approval. Joint ventures are given the right to operate for 30 years, with a possible 30-year extension. Foreign joint venture partners are guaranteed the right to transfer abroad their net operating profits and proceeds from the sale of shares, and to repatriate capital. Qualifying investments under the Foreign Investment Law of 1967 also receive exemptions from, or a reduction in, import duties on capital goods, equipment, and raw materials used in the investment.

A minimum of 20 percent Indonesian equity is required at the outset of a joint venture. Indonesian participation in the joint venture must be increased to a minimum of 51 percent within 15 years of when the joint venture begins commercial operation. A minimum of 45 percent Indonesian equity is required if 20 percent of a project's shares are sold through

capital markets. Equity participation by the Asian Development Bank, Islamic Development Bank, and the International Finance Corporation is considered Indonesian participation.

However, in the following cases, only 5 percent Indonesian equity is required at the outset: 1) the total investment is over US $10 million, 2) 65 percent of production is for export, or 3) investment is targeted in remote locations (10 of 27 provinces currently qualify). The government will, upon request, extend the divestiture period from 15 to 20 years for these special cases. A joint venture located in a "Bonded Zone" and exporting 100 percent of its production requires only a minimum of 5 percent Indonesian participation, with no further obligation for divestiture on the part of the foreign partner.

According to other speakers, the private sector in Indonesia tends to be risk-averse, preferring investments with a payback of less than two years, as well as investments that increase capacity rather than reduce costs or improve efficiency. A USAID study on rice residue power generation, for example, found that Indonesian investors require an extremely short payback period of less than three years and high returns (35 to 45 percent).

Pricing for Private Power Sales

The price consumers pay for privately generated electricity is critical in stimulating private power development. One Indonesian speaker reiterated that the price paid to the private producer is subject to government agreement. Four factors are considered in setting electricity prices: 1) production costs, including considerations of efficiency, 2) scarcity of the primary energy resources used, 3) scale of operations and the interconnection system used, and 4) the availability of financing for investments.

Currently, there are six main suppliers of electricity to PLN, ranging in size from 30 MW to 600 MW. In general, the price paid to these producers is based on either the cost of generation or on PLN sales rates.

One speaker from PLN stated that for PLN, computing the purchase price is related to the uncertainties regarding the rate of return, which methodology is appropriate, and which escalation provisions will be included for inflation and fuel prices. In addition, whether the private producer will sell power under a "take-or-pay" agreement or under PLN's current method of dispatching in order of merit is taken into consideration. It was recognized that the lack of a guaranteed price makes the private sector reluctant to invest in power production. However, according to the PLN speaker, in order to stimulate true competition and arrive at the least-cost generation mix, the government must remove take-or-pay guarantees and preferential treatment for certain types of electricity generators.

PLN has looked at both short-run and long-run marginal costs for purchase price determination. The long-run marginal cost has become the ceiling price for the private sector bid. The importance of considering the avoided cost to the utility of not building another facility was also stressed. Another cost to consider is the economic cost of power shortages and outages.

Purchase price appears, also, to be the principal issue in private power generation in the Philippines, where, although the avoided cost concept seems to be gaining acceptance, it generates difficulties when translated into practical terms. For example, NPC, in the Philippines, has identified coal-fired and geothermal plants as the least-cost avoidable resources. The bases and assumptions used in calculating the avoided cost are robust (i.e., consistent under a variety of scenarios) and represent the utility's best perception of the future. However, once construction of coal-fired and geothermal facilities begins, the avoided cost of the utility system changes (target reliability levels are assumed to be met with plant additions) and cost overruns or underruns may be incurred during the project's actual implementation. In contrast, private power proposals are firm and the risk of cost overruns is built into the proposals. Small-scale projects -- mini-hydro, cogeneration, biomass, etc. -- may have to be priced at the new avoided cost. Firm power, as-available power, dispatchability, and seasonality further complicate the pricing issue.

One speaker suggested that the primary problem with private power development in Indonesia is competition from PLN. As a state-owned company with a mandate to develop

the nation's electric power system, PLN may be asked to comment on a private power bid and then submit a counter bid. This can occur because PLN can accept a lower rate of return than private generators and because it can borrow under favorable international donor agency terms. It is speculated that PLN may also underestimate its costs to ensure a winning bid and then recover the cost overruns near the end of construction. This desire to expand is common among many state-owned companies. However, when such companies have established successful relationships with private power generators and see the resulting improvement in their return on assets, they become convinced of the value of private power generation.

Capacity Acquisition Process[7]

The Government of Indonesia currently does not have a process for soliciting proposals from the private sector to meet the capacity requirements of PLN. The capacity acquisition approaches pursued by other countries, therefore, could be used as a model for Indonesia.

In the United States, the utility capacity acquisition process includes project solicitation, project evaluation, and project selection. Project solicitation can be conducted for predefined project characteristics such as the site, size (MW), fuel source and technology. This approach would be used, for example, to replace a specific power plant in a utility's generation expansion plan. Another approach is to have a predefined capacity block, with total size (MW) and maximum price for capacity and energy articulated in the solicitation. In this case, the market is allowed to define the specific projects and sites. The frequency of the solicitation is also important in maintaining the interest of project developers.

In issuing a solicitation, the evaluation criteria and the relative importance of price and non-price (e.g., fuel use, dispatchability) project characteristics should be clearly articulated. The solicitation should identify a threshold for minimum project information and status. Information requirements might include financing, development experience, and engineering

[7] The process for approving private electricity undertakings is covered in the institutional and regulatory framework discussion in Section 3.3 of this report.

specifications. The developers must also be made aware of any requirements for contract terms or security provisions. Project selection will require technical skills, such as engineering, finance, economics, and law, and sophisticated judgment on the part of the project reviewer(s).

In addition to the process of evaluation and selection, a series of primary agreements is needed. These agreements are used to allocate responsibilities and risk among investors (debt and equity), the developer, the utility and the government. Sample types of agreements include:

- a letter of intent (LOI) following project selection, providing the developer with the exclusive right to pursue the project for a given period of time;
- a power purchase agreement (PPA), sometimes known as a power sales agreement, between the developer and the utility which covers price, dispatchability provisions, performance and maintenance standards, *force-majeure* provisions, mechanisms for the resolution of disputes, etc.;
- a construction agreement between the developer and the contractor, the terms of which the utility should review;
- an operation and maintenance agreement in circumstances where the developer is not the project operator; and
- a fuel supply agreement, which details the terms and conditions of fuel price, quantity, duration of supply, penalties, any contemplated interruptions in supply, and fuel quality.

The importance of integrating private generation in a utility's overall planning process, and the streamlining of solicitation and evaluation procedures as a key element in the successful implementation of private power generation was emphasized by a number of speakers.

In the Philippines, there are two systems under consideration which can be also used in Indonesia: a model contract with published avoided cost and a well-articulated bidding procedure. The latter appears more conducive to large-scale technology projects, while the former seems appropriate for small-scale projects. In both systems, project milestone

schedules and the evaluation methodology should be formulated to ensure the smooth and clean realization of private sector projects.

One speaker pointed out that private sector projects should be an integral part of the least-cost power expansion plan developed by the utility. A case-by-case evaluation is required, taking the country's economic situation into consideration. Unsolicited bids should be avoided. Selection on a competitive bidding basis is preferable because such bids would comply with investment planning, load dispatching, system reliability, etc. According to this speaker, the private sector's involvement is likely to be on the generation side and will meet only part of system requirements. Public utilities will continue to play a central role, but the private sector can make a significant contribution to a nation's power system.

2.4 POWER GENERATION OPPORTUNITIES IN INDONESIA

This section summarizes workshop presentations on a number of power generation opportunities for private sector in Indonesia. These include industrial generation and cogeneration, natural gas, coal, nuclear power, geothermal power, biomass, and hydropower. The following sections are based on presentations by Djurzan Hamid of the Ministry of Mines and Energy, Vincent Radja of PLN, Thomas Minette of UNOCAL, John Kadyszewski of USAID, Charles Ebinger of Energy Development International and David Keith of RCG/Hagler, Bailly.

Industrial Generation and Cogeneration

An immediate opportunity exists for third parties to develop industrial facilities in Indonesia with in-plant generation facilities. One speaker noted that there are several large industries that sell power to PLN. Their combined generating capacity is over 1,440 MW. The industrial sector has another 3,500 MW installed in small captive power plants, almost 1,500 MW of which are connected to the grid and used as standby power.

According to another speaker, one option for increasing non-PLN power generation is to allow industries to spin-off industrial self-generation power plants into independent power

generation facilities. The advantages of this option, according to this speaker, are: 1) spin-offs result in cash to the industrial concerns which can be used to expand or enhance their mainstream business; 2) removing the burden of responsibility for power generation from industrial plants allows greater management focus on mainstream business; 3) the addition of capacity to the PLN grid does not affect the government's capital budget or require the assumption of additional foreign debt; 4) high power reliability and availability are assured, which in turn fosters the productivity of industrial facilities; 5) the maximum economic benefit is gained on a plant's existing investment in capital infrastructure and trained powerplant staff; 6) the PLN grid realizes increased reliability and stability; 7) the industrial frontier is electrified more rapidly; and 8) opportunities for least economic cost power generation can be exploited through cogeneration.

Natural Gas

Natural gas reserves in Indonesia are estimated to be 109 trillion cubic feet (TCF). According to one government speaker, by the year 2000, Indonesia will be producing approximately 2.5-3 TCF of natural gas per year. The government also has plans to add 2,300 MW of natural gas generating capacity by the year 2015. Some of this capacity could be developed by the private sector. For example, in September 1988, PLN requested bids from the private sector to develop the 900 MW combined cycle Gresik Power Plant. PLN is accepting proposals for turnkey contracts or BOT arrangements for this project. The future prospects for gas-fired private power projects are likely to hinge on the success of the Gresik project. However, the largest gas fields are relatively remote; the Natuma Field in North China Sea has reserves of 41 TCF and the Arun Field in North Sumatra has 14 TCF.

Coal

Indonesia's coal reserves are estimated at 20 billion tons, mostly situated in Kalimantan and Sumatra. The government currently has plans to develop 7,000 MW of coal-fired capacity. As in the case of natural gas, the private sector could propose coal-fired power plants on

BOT terms. The development of coal-fired projects by the private sector will greatly depend on the ability of private developers to develop Indonesia's indigenous coal reserves.

Nuclear Power

In 1987, the Government of Indonesia solicited proposals from the private sector to construct and operate a 600-650 MW nuclear power plant near Jepara, Central Java. According to one senior government representative, the private sector's implementation of long lead time, high capital cost, large-scale generation projects such as nuclear power plants deserves closer investigation. He noted that it would be useful to combine BOT schemes for nuclear power projects and shorter lead time projects which require much less capital investment, such as combined cycle power plants.

Geothermal

The total geothermal resource base in Indonesia is estimated to be 10,000 MW. A total of 217 geothermal locations were identified during REPELITA IV. Many of the smaller islands (e.g., Sunda) have geothermal potential. PLN has shown a particular interest in the private development of geothermal resources, including mini-geothermal plants for rural areas. This approach would allow PLN to concentrate its available funds on major generation projects (such as Suralaya on Banten Island and Paiton), and on transmission and distribution, and leave the small generation projects to the private sector.

The development of geothermal resources is governed by specific laws. In 1981 PERTAMINA, the state-owned oil company, was granted the authority to develop all geothermal energy in Indonesia. Presidential Decree No. 22 of June 1, 1981 allows PERTAMINA to enter into joint operation contracts with companies interested in developing geothermal resources. Two such joint ventures exist: UNOCAL Geothermal of Indonesia, Inc. and AMOSEAS Indonesia, Inc.

In 1986, the Ministry of Mines and Energy invited UNOCAL to offer a proposal for geothermal development. UNOCAL proposed to build a power plant at Gunung Alad and

deliver electricity to PLN under a BOT arrangement. The proposal consisted of a price for steam delivery plus a generation price for converting steam to electricity and delivering it to PLN. This two-part price for electricity delivered would have allowed PLN to take over the plant after a negotiated period and thereafter only pay the steam price. Project financing was to be secured from a combination of international commercial banks, the Overseas Private Investment Corporation (U.S.), and the International Finance Corporation.

In the final stages of price negotiation, an Italian consortium backed by the Government of Italy's soft financing terms offered to develop the same plant for PLN on a turnkey basis. Because of the favorable financing terms available for the turnkey approach, PLN selected not to pursue the BOT option.

Biomass

The market for privately owned biomass generation projects will be concentrated in Indonesia's rice and paper mill industries, where the availability of residues is sufficient to support small power projects. For example, according to one speaker, there is adequate rice husk in Indonesia available for small (600 kW to 1.5 MW) power plants. However, because individual mill availability is limited, residue collection and transport would be necessary. And because the technologies that are now commercially available are too large for Indonesia, down-sizing would also be required. A study by USAID has found that adequate returns could be achieved with a reliable transport network, high load factors, and a market for byproducts such as ash.

According to the USAID study, wood waste-fired power plants could be economically attractive in small (e.g., 2.5-3 MW) sizes. Wood waste at the nation's plywood plants would be sufficient to support 150 MW of dispersed captive generation. Wood waste at saw mills could provide 800 MW of distributed captive power generation. An economic feasibility assessment of a 2.5 MW wood waste plant showed that the project would be fully paid for in six years or less, with a 25 percent return on equity (even with the current 50 percent subsidy on diesel fuel).

2.5 PRIVATE POWER ACTIVITIES OF INTERNATIONAL DEVELOPMENT ORGANIZATIONS

This section summarizes the types of support for private power development offered by USAID, the Asian Development Bank, and a multi-donor program sponsored by the World Bank, USAID, and other development organizations and is based on presentations by Robert Ichord and John Hammond of USAID and Vladimir Bohun of ADB.

U.S. Agency for International Development

USAID's support for private power focuses on institutional development, information dissemination, financial support, and project development assistance. In terms of institutional development, USAID has conducted assessments of the potential for private power production in Pakistan, India, Thailand, the Philippines, Costa Rica, the Dominican Republic, and Indonesia. These studies have identified the impediments to, and the opportunities for, power produced by the private sector. In addition, USAID has provided advisory assistance to some governments in introducing private power policies and programs.

USAID has also provided information to government-owned utilities, prospective private developers, and financial institutions through workshops, a centralized private power database, a periodic newsletter *(Private Power Reporter)*, and training courses.

Financial support from USAID has come through leveraging the agency's resources to attract private, public and development bank funding for private sector projects. In Pakistan, USAID has contributed substantial resources to a fund established in association with other development agencies to finance private power projects. USAID is working to develop a similar private sector energy development fund for the Dominican Republic.

USAID has provided project development assistance by identifying potential project opportunities, funding feasibility studies, and financing actual projects in Indonesia, the Philippines, Kenya, the Dominican Republic, Pakistan, Sudan, Costa Rica, Jamaica, and

Thailand. Finally, USAID provides technical assistance to many countries by developing and disseminating financial and planning models required for evaluation of private power projects. One such model, PROJEV, has been used in Pakistan to evaluate the financial viability of private power projects.

Asian Development Bank

The Asian Development Bank (ADB) provides assistance in the form of information accumulation and dissemination on key institutional, financial, and technical issues involved in private sector project development and integration. The Bank also makes loans and equity contributions to power project undertakings by the private sector. For example, ADB is considering making both a loan and an equity contribution to the 200 MW Hopewell gas turbine project at Navotas, Philippines.

The ADB has also funded a survey of the present situation in Asia with regard to private sector participation in power development. The survey covered six countries -- India, Indonesia, Malaysia, Pakistan, Philippines and Thailand.

Multi-Donor Support Program

During the first half of 1988, the World Bank, with substantial assistance from USAID and other bilateral development organizations, developed the overall framework for a multi-donor program of support for Pakistan's private power policy. The World Bank's umbrella project was approved in June 1988 and the agreement was signed with the Government of Pakistan in July 1988. The project has three main elements: institution strengthening, a private sector energy development fund, and a security package.

Institution strengthening has been conducted in two areas: project review (such as planning, project solicitation, review and approval) and project financing (setting up the necessary infrastructure to finance private sector projects).

A private sector energy development fund is being created within Pakistan's National Finance Development Corporation. The donor agencies will provide loans and grants with sovereign guarantees to the Government of Pakistan. These funds will, in turn, be lent to the fund at an interest rate that allows the fund to accumulate resources over time to support private energy projects. The fund will lend up to 30 percent of the cost of an approved project. The initial terms of the loans will be 14 percent interest for 23 years, with up to an eight-year grace period. The rate is to be reviewed annually.

Another critical element of the program in Pakistan is the security package. The government will guarantee the power purchase agreement between the Water and Power Development Authority and the private producer. The program would provide contractor performance guarantees, a debt service reserve escrow account, and subordination of the fund's debt to commercial loans and/or export credits. Finally, the World Bank will closely monitor the program by reviewing proposals and project implementation.

CHAPTER 3: PROPOSED FOLLOW-UP ACTIVITIES

In his closing remarks, Ir. Rahardi Ramelan, deputy director of the Indonesian Agency for Assessment and Application of Technology, reiterated that the public sector could not afford to invest all that is required for the nation's future electric energy expansion. Indonesia is committed to making private sector investment a valid and workable alternative. Mr. Ramelan suggested that four specific actions be taken on the part of the Government of Indonesia, PLN, private industries, investors, and USAID. These are:

1. Establish a task force to develop implementation guidelines for Law No. 15 of 1985, which could be coordinated by an interagency group within the Government of Indonesia;

2. Use the Gresik combined cycle power plant as a test case for build, own and transfer (BOT) arrangements;

3. Identify other power projects suitable for private power participation; and

4. Undertake a macroeconomic study analyzing the relationship between electric power supply and the economy, and the hidden costs of unserved electricity demand.

Several of the participants voiced the opinion that the conference was a success. Many felt that the issues raised were a good beginning for examining the private sector opportunities for generating power in Indonesia.

APPENDIX A: WORKSHOP AGENDA

INTERNATIONAL WORKSHOP ON OPPORTUNITIES FOR PRIVATE SECTOR POWER GENERATION IN INDONESIA

March 6-8, 1989
Jakarta, Indonesia

AGENDA

DAY 1: THE INDONESIAN PERSPECTIVE

Welcome and Opening Remarks

Major General T.B. Silalahi, Director General, Ministry of Mines and Energy

Hon. Paul J. Wolfowitz, U.S. Ambassador to Indonesia

Keynote Speech

Prof. Dr. Ing. B.J. Habibie, State Minister for Research and Technology

Power Situation in Indonesia

Ir. Djurzan Hamid, Senior Assistant to the Minister of Mines and Energy for Electrical Power Matters

Ir. Ermansyah Jamin, President Director, PLN

Financing

Ir. Edi Sanyoto Sastrowardoyo, Chairman of the Investment Coordinating Board (BKPM)

Existing Legislation and Regulations

Ir. Moh. Mochtar Wiryosaputro, Director of Power Utilities Regulation and Supervision, Directorate General of Electrical Power and New Energy

Mr. Gregory Churchill, Attorney, Ali Budiardjo, Nugroho, Reksodiputra

Dr. Charles Ebinger, Director, Energy/Development International

Panel Discussion: Policies, Legislation and Financing

Moderator: Ir. Rahardi Ramelan, Deputy Director, Agency for Assessment and Application of Technology (BPPT)

Panel: Mr. Kodyat Samadikun, Director of Construction, PLN

Dr. Siswanto, Bank of Indonesia

Ir. Zulkifli Indrakesuma, Member, House of Representatives (DPR-RI)

Mr. Oskar Suryaatmadja, Director General for Monetary Affairs, Ministry of Finance

DAY 2: PRIVATE POWER OPTIONS

Framework for Private Power Generation

Dr. Pirooz Sharafi, Manager, RCG/Hagler, Bailly, Inc.

Mr. Harvey Salgo, Attorney, Energy Systems Research Group, Inc.

Mr. Eric C. Woychik, Advisor, California Public Utilities Commission

Panel Discussion: Country-Specific Experiences

Moderator: Dr. Wardiman Djojonegoro, Assistant I, Agency for Assessment and Application of Technology (BPPT)

Panel: Mr. Deogracias Peralta, Vice President of System Planning, National Power Corporation of the Philippines

Dr. Robert F. Ichord, Jr., Chief of Energy and Natural Resources, Asia Near East Bureau, U.S. Agency for International Development

Independent Power Projects in Indonesia

Panel Discussion: Indonesia's Experience with Private Power

Moderator: Dr. Zuhal, Director, Non-Mineral Resources, Agency for Assessment and Application of Technology (BPPT)

Panel: Ir. Sambodho, PLN

Ir. Djauhar Masjhur, PT INALUM

Dr. Hari Gianto, Ministry of Cooperatives

Mr. Thomas Minette, Vice President, UNOCAL Geothermal of Indonesia, Ltd.

Mr. David Keith, RCG International

Panel Discussion: Private Power Opportunities

Panel I: Oil, Gas and Geothermal

Moderator: Prof. M.T. Zen, Deputy for Natural Resources Development, Agency for Assessment and Application of Technology (BPPT)

Panel: Ir. Marzuan, Secretary of Directorate General of Oil and Gas, Ministry of Mines and Energy

Mr. G.A.S. Nayoan, Director of Exploration and Production, PERTAMINA

Ir. Vincent Radja, PLN

Ir. Wahidin Subrotomodjo, Director of Volcanology, Ministry of Mines and Energy

Mr. Thomas Minette, Vice President, UNOCAL Geothermal of Indonesia, Ltd.

Panel II: Coal

Moderator: Dr. Johannas, Director of Mines, Directorate General of Mines

Panel: Ir. Achmad Priyono, President Director, State Coal Mining Corporation

Ir. Nengah Sudja, Head of Division for System Planning, PLN

Panel III: Renewable Energy

Moderator: Dr. A.J. Surjadi, Director of New Energy Development, Directorate General of Electrical Power and New Energy

Panel: Dr. A.B. Van Rennes, U.S. Science Advisor to the State Minister of Research and Technology

Dr. Benny Mosendi, Head, Subdirectorate for Forest Product Programs

Dr. Saswinadi Sasmoyo, Head, Center for Technology Research

Ms. Elaine Evans, National Hydropower Association, U.S.A.

Mr. John Kadyszewski, Project Manager, Office of Energy, U.S. Agency for International Development

DAY 3: FINANCIAL, TECHNICAL AND INSTITUTIONAL ISSUES

Private Sector Program Issues

Mr. James Harral, Vice President, Pacific Gas and Electric Co.

Mr. Avinder S. Bindra, Executive Director, Citicorp International, Ltd., Hong Kong

Mr. Steven Simpson, Director Advisor, P.T. Price Waterhouse Siddik

Dr. Donald Hertzmark, Chief of Party, Energy Pricing Policy Project

Role of International Development Organizations

Mr. John Hammond, Senior Energy Advisor, Office of Energy, U.S. Agency for International Development

Dr. Robert F. Ichord, Jr., Chief of Energy and Natural Resources, Asia Near East Bureau, U.S. Agency for International Development

Mr. Vladimir Bohun, Senior Project Engineer, Asian Development Bank

Workshop Conclusions and Closing Remarks

Ir. Rahardi Ramelan, Deputy Chairman, Agency for Assessment and Application of Technology (BPPT)

Mr. Alain Streicher, Senior Vice President, RCG/Hagler, Bailly, Inc.

APPENDIX B: LIST OF WORKSHOP PARTICIPANTS

LIST OF ATTENDEES
INTERNATIONAL WORKSHOP ON
OPPORTUNITIES FOR PRIVATE SECTOR
POWER GENERATION IN INDONESIA
HOTEL BOROBUDUR
6 MARCH 1989

COMPANY/ADDRESS	NAME	TITLE/POSITION
AGANCE FRANCE PRESSE Jl. Indramayu 18 Jakarta Phone 334877	Bryan McManus	Journalist
PT AMYTHAS E.A. Jl.Kemang Raya No.17A Jakarta Selatan Phone 7990828	Soenyoto Hadiwardjo	Director
P.T. ANGGREK MEKAR SARI Jl. Borobudur No. 10/5 Phone 881942	Ibratama Munir Kimin B.E.	Direktur
ARCO PO 63/JKT Phone 713166	Richard Fuller	Manager Gas
ARCO Indonesia Atlantic Richfield Bali North Inc. Panin Bank Building Jl. Jendral Sudirman, Senayan P.O. Box 63/Jkt Jakarta, 10002 Phone 7397474 Ext. 765	Marvin J. Hagan	Vice President
ASIAN DEVELOPMENT BANK Manila, Phillipines	M. Inaga	Sr. Investment Officer

ASIAN DEVELOPMENT BANK P.O. Box 789, 1099 Manila Manila, Phillipines Phone 834 3398	Vladimir Bohun	Sr. Project Engineer
ALSTHOM INTERNATIONAL Wisma Harapan 3rd Floor 34, Jl. Sudirman Jakarta 10220 Phone 586 962 ; 586 963	Andre Wicker	General Manager
AMERICAN EMBASSY Jl. Merdeka Selatan 5 Jakarta 10110	Richard G. Watkins	Petroleum Officer
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