

GLOBAL  
ENVIRONMENT  
FACILITY

REPUBLIC OF INDONESIA  
Renewable Energy Small Private Power Project

Project Document  
March 1997

**Report No. 16348-IND**

**Republic of Indonesia**  
**Renewable Energy Small Private Power Project**

**Project Document**  
**March 1997**

**Indonesia Policy and Operations Division**  
**Country Department III**  
**East Asia and Pacific Region**

## CURRENCY EQUIVALENTS

Currency Unit - Indonesian Rupiah (Rp)  
(As of September 1996)

US\$ 1 = Rp 2,341  
Rp 1 billion = US\$ 0.427 million

**FISCAL YEAR**  
April 1 - March 31

## WEIGHTS AND MEASURES

1 metric ton	=	1,000 kilograms (kg)
1 liter (l)	=	0.0063 barrels (bbl)
1 kilometer (km)	=	0.6215 mile (mi)
1 kilovolt (kV)	=	1,000 volts (V)
1 megavolt ampere (MVA)	=	1,000 kilo-volt amperes (kVA)
1 megawatt (MW)	=	1,000 kilowatts (kW)
1 gigawatt hour (GWh)	=	1 million kilowatt hours (kWh)
1 terrawatt hour (TWh)	=	1 billion kilowatt hours (kWh)

## ABBREVIATIONS

BAKOREN	-	National Energy Board
BAPPENAS	-	National Development Planning Agency
BPPT	-	Agency for the Assessment and Application of Technology
CO <sub>2</sub>	-	Carbon Dioxide
DGEED	-	Directorate-General of Electricity and Energy Development
DRE	-	Decentralized Rural Electrification
EA	-	Environmental Assessment
FCCL	-	The Framework Convention on Climate Change
GEF	-	Global Environmental Facility
GBHN	-	Garis-Garis Besar Haulan Negara (Outlines of State Policy)
GOI	-	Government of Indonesia
IERR	-	Internal Economic Rate of Return
LRMC	-	Long Run Marginal Cost
MME	-	Ministry of Mines and Energy
MOC	-	Ministry of Cooperatives and Small Enterprises Development
PB	-	Participating Bank
PERTAMINA	-	National Oil and Gas Company
PLN	-	State Electricity Corporation
PIP	-	Project Implementation Plan
PSG	-	Project Support Group
PV	-	Photovoltaic
RE	-	Rural Electrification
REPELITA	-	Five-Year Development Plan
RESP	-	Renewable Energy Small Power
TA	-	Technical Assistance

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## **PART I: Project Summary**



**INDONESIA**  
**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**  
**LOAN/GRANT AND PROJECT SUMMARY<sup>1</sup>**

<b>Borrower</b>	: The Republic of Indonesia
<b>Implementing Agency</b>	: Private sector firms engaged in the generation of electricity from renewable resources
<b>Beneficiaries</b>	: Not applicable
<b>Poverty</b>	: Not applicable
<b>Loan Amount</b>	: US\$66.4 million equivalent
<b>Terms</b>	: Standard variable interest rate for a term of 20 years, including five years of grace for currency pool loans.
<b>Commitment Fee</b>	: 0.75 percent on undisbursed loan balances, beginning 60 days after signing, less any waiver.
<b>Grant Amount</b>	: GEF Trust Fund Grant of SDR XX million (US\$4.0 million equivalent)
<b>Terms</b>	: Grant
<b>Financing Plan</b>	: See para 4.22
<b>Economic Rate of Return</b>	: 50% or better
<b>Map</b>	: IBRD25506R
<b>Project ID Number</b>	: ID-PA-42882

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<sup>1</sup> GEF and IBRD are financing mutually dependent activities and therefore this document is intended to meet both GEF and IBRD processing requirements. A GEF project document based on the SAR has been prepared to meet GEF Council and Public Information needs.

# 1. THE ENERGY AND POWER SECTORS

## Energy Sector Overview

1.1 Indonesia is richly endowed with diverse and large energy resources including oil, natural gas, coal, hydropower and geothermal. The oil and gas sectors continue to play a critical role in the Indonesian economy, together accounting for over 85 percent of commercial net energy consumption and for about 20 percent of the country's export receipts.

1.2 Indonesia's basic goals and policies for the future development of the energy sector are described in the Outlines of State Policy (GBHN), promulgated by the People's Consultative Assembly (MPR) in March 1993 to guide the formulation of the Sixth Medium-Term (five-year 1994/95-1998/99) Development Plan (REPELITA VI); and the Second Stage Long-Term (twenty-five year) Development Strategy (PJPT-II). The GBHN highlights the importance for Indonesia's sustained economic and social development of meeting its rapidly growing energy needs efficiently -- including through conservation and diversification of primary energy resources and their more efficient utilization -- and of minimizing the adverse environmental and social impacts of energy use.

1.3 In the power sub-sector, the GBHN recognizes that an adequate, reliable and reasonably priced electricity supply is essential for the country's continuing development, emphasizing its essential role in serving the needs of the productive sectors and in contributing directly to improving the living standards of the people in all regions of the country. Rural electrification (RE) is a key and integral part of the Government's rural development strategy and the long-term goal is to electrify all villages and enable the basic services provided by the modern energy form, electricity.

1.4 The Government of Indonesia (GOI) has also relied on the following policies in support of its objectives for the energy sector:

- (a) **diversification:** The Government's energy policy has long emphasized diversifying domestic energy consumption away from oil towards alternative and more economic and indigenous energy resources that either have a non-exportable surplus, such as coal and natural gas, or are renewable and non-tradable (hydro, geothermal). Significant progress has been made in the power sector, which is a major user of petroleum fuels, and plans call for a further reduction of oil's share in power generation from about 15 percent in 1995/96, to about 5 percent by the end of this decade. Commitments have been recently concluded for numerous and large geothermal power plants.
- (b) **energy pricing:** On the demand side, the Government's policy has been to maintain average petroleum product prices at or above international parity (efficiency pricing), while cross-subsidizing the price of kerosene in order to ensure its affordability, with an implicit tax on gasoline. Likewise with electricity, while periodic adjustments have generally maintained the average retail price close to the long-run marginal cost of supply in Java, electricity prices have been maintained below economic cost for small residential and industrial users who account for about 40 percent of sales. The Government has also maintained a uniform price structure for electricity and petroleum products in all parts of the country.
- (c) **private sector participation:** The private sector operates significant amounts of captive power capacity, and is expected to play an increasingly important role in the supply of oil,

gas and electricity. In oil and gas, Pertamina forms joint ventures with private Production Sharing Contractors (PSCs) for exploration and production.

Private sector participation is also being welcomed in the emerging gas transmission grid. In power, 55% (11,600 MW) of the additional grid capacity planned for Indonesia between 1994/95 and 2003/04 (excluding captive power) is projected to come from independent power producers (IPPs). To date, over 2,500 MW of IPP capacity is under construction and expected to come on line by 1999-2000. In aggregate as of November 1996, Power Purchase Agreements (PPAs) have been signed with IPPs for about 7,500 MW of capacity, of which some 2,200 MW will be generated by geothermal, 800 MW by gas and about 4,500 MW by coal. The Government is also considering private participation in the recently created generating company subsidiaries of PLN, the national power utility.

The recently introduced small power purchase agreement (a tariff and offer to purchase on the basis of a simple standard contract) is designed to encourage development of small scale private generation plants

- (d) **regionally balanced development:** The GOI maintains a uniform price for electricity and petroleum products in all parts of the country; and has plans to extend the supply of electricity in a balanced manner to all parts of the country. This policy entails the subsidization of higher cost energy supply to outside Java and to the rural population.
- (e) **environmental protection:** The GOI's environmental policies include support of greenhouse gas reduction, and development of renewable energy resources. The Basic Environment Law of 1982 provides the overall framework. The Government has established and utilizes uniform procedures and guidelines for the preparation, and approval of environmental impact analysis (AMDAL), for issuance of environmental clearances, as well as periodic reporting requirements on environmental management and monitoring during project implementation.

## **Sector Institutions**

1.5 The principal agency responsible for implementing Government policies in the energy sector is the Ministry of Mines and Energy (MME); which coordinates all activities in the energy sector and supervises the state enterprises in the sector: PERTAMINA (oil, gas and geothermal), P.T. Bukit Asam (coal), PGN (gas distribution) and PLN (electricity). Other ministries and agencies are also involved in the sector, for example, the Ministry of Public Works is responsible for hydropower resource surveys and the operation of multipurpose hydro plants, the National Atomic Energy commission is responsible for nuclear development, and the Ministry of Cooperatives and Small Enterprises Development (MOC) is responsible for enhancing the role of cooperatives in rural electrification. An inter-ministerial National Energy Board (BAKOREN) coordinates energy policies and development with those of other sectors. BAKOREN is supported by a Technical Committee (PTE) consisting of senior officials in different departments, chaired by the Director General of Electricity and Energy Development (DGEED). The electricity subsector is regulated by the MME through the DGEED. The organization chart of MME is shown in Annex 1.1. Environmental policy development is led by the State Coordinating Minister for Environment and implementation is led by the national (BAPEDAL) and newly enabled regional (BAPEDALDA) Environmental Impact Management Agencies.

## Electricity Subsector

1.6 The Electricity Act (Law No. 15 of 1985) defines the legal framework for electricity sector. Under this Act, PLN, the State Electricity Corporation that was established by Government Regulation No. 18/1972, has both the right and obligation to supply power in Indonesia. The provisions of the Electricity Act are amplified in Government Regulation No. 17/1990 for PLN, the State Electricity Corporation; and No. 10/1989 for others. The Electricity Act permits establishment of private power producers, distributors and licensees. Presidential Decree No. 37/1992 specifically authorizes private sector participation under BOO schemes, and permits cooperatives and other legal entities to generate, transmit, and distribute power for public use.

1.7 The power sector has expanded rapidly during the 1980s and 1990s. Electricity sales of PLN grew at an average annual rate in excess of 14% between 1981/82 and 1995/96. During the same period, the number of customers grew nearly six-fold, from 3.2 million to about 21.5 million. In order to meet this growth, PLN's installed capacity increased nearly five-fold from about 3,000 MW in 1981/82 to over 15,000 MW in 1995. Over the same period, PLN's implementation capacity has grown significantly, whereby it is now connecting close to 2 million new customers a year, a pace unmatched by a single utility, and PLN now carries out an investment program of about US\$3.5 billion annually.

## Sector Issues and Strategy

1.8 **The task ahead** Notwithstanding the impressive achievements highlighted above, only 40% of rural households have electricity--well below reported levels in Thailand (about 75%) and Malaysia (about 98%). Electricity consumption per capita is only around 260 kWh per year, less than in many countries with lower GDP per capita. Many businesses depend on captive power for part or all of their supply. Frequent outages and voltage and frequency fluctuations impose high costs for industrial and commercial customers, while in some areas network bottlenecks delay and/or increase the costs of new industrial ventures.<sup>1</sup> To cope with this situation, businesses have to date installed some 10,500 MW of captive power generators of which some 8,000 MW is in the form of relatively small, inefficient and high cost diesel plants. Finally, the wide disparities in coverage -- urban-rural as well as across Indonesia -- pose a direct challenge to the Government's objective of achieving a balanced spatial distribution of development and to reduce the inequality in quality of life.

1.9 **Challenges** Organizing the power sector --industry structure, regulation, planning, balancing the roles of PLN and the private sector --to bring about marked improvements in service delivery standards and bring them in line with regional best practice, while maintaining competitive prices, and quickly and efficiently expanding the access of electricity to households throughout the country, poses a formidable challenge. Prospects for attracting the large sums of money required year-in-and-out to just one sector in Indonesia -- US\$ 5-6 billion per year -- must also be viewed against the backdrop that the Government is hard pressed to maintain past levels of financial contributions to PLN, because of increasing demands on its resources from priority social sectors. Further, the task of financing expansion of rural electrification (RE) coverage and more generally service provision outside Java is daunting to say the least; due to the geographic dispersion and low energy demand of much of the rural population, the unit costs of

<sup>1</sup> *Indonesia: Economic Consequences of Power Sector Inadequacy in the Manufacturing Sector, Yellow Cover Report No. 15623-IND, EA3IE, World Bank, June, 1996*

conventional means of electrification by grid extension and diesel generation are extremely high , especially outside Java.

**1.10 Strategy** The Government, with Bank assistance, has formulated and initiated a major reform of the sector. The four pillars of the ongoing reform are: (i) move the sector from monopoly and government domination to a multi-operator mixed ownership environment in order to access additional management and finance capacity; (ii) decentralize, corporatize and divest PLN, to enhance operating performance and client service quality , and to prepare the company to directly access capital markets; (iii) reform regulatory and sectoral functions to promote PLN's commercial autonomy and private sector entry and thereby promote high quality service at least cost; and (iv) rationalize tariff levels to strengthen sector finance, while providing incentives to PLN and the private sector to deliver performance more in line with best practices.

### **Climate Change**

**1.11** Indonesia has ratified the FCCC on August 23, 1994, so that it is eligible to receive GEF funds under this convention. In order to help fulfill its FCCC national commitments, Indonesia has initiated two greenhouse gas mitigation strategy studies. The Asia Least-Cost Greenhouse Abatement Strategy (ALGAS) project, financed by UNDP/GEF, examines Indonesia's GHG emission reduction options in an Asia regional context. Indonesia is also a participant in the second round of study activities financed under the U.S. Country Studies Program. Although both studies are still under preparation, the relevance of renewable energy as a greenhouse emissions abatement option for Indonesia is clear. The country is characterized by a large, growing and dispersed rural population, a substantial fraction of whom are not electrified but who presently consume fossil fuel-based energy for lighting and radio and TV services. Further, much of the electricity supply outside Java is generated by diesel fuel. As low or zero greenhouse gas emitting technologies, renewables based power generation can meet these basic energy demands while substituting for higher polluting kerosene, and diesel fuel.

## 2. RENEWABLE ENERGY DEVELOPMENT

### Renewable Energy for Sustainable Development

2.1 Indonesia needs to deploy aggressively new and sustainable sources of energy for power generation to complement conventional supply options, in order to maintain its economic momentum and dynamism while advancing further the impressive gains already achieved in improving the well being of its population. For almost two decades, Indonesia's electricity generation capacity has on average doubled every five years. Yet, today, nearly 60 percent of the population -- about 115 million people -- does not have access to electricity, and usage per capita is low and even below those for countries with lower income per capita.

2.2 Continued and sole reliance on conventional energy sources and delivery modalities will impose a massive financing burden on the Government and PLN's customers. Additionally, burning of fossil fuels would also contribute to the "greenhouse effect", the primary contributor to global warming. Increasing the use natural gas -- as Indonesia has been doing -- is a good idea since gas is a cleaner fuel than coal or oil. However, Indonesia's non-exportable natural gas supplies, are ultimately limited. And burning natural gas, while reducing local pollution will still contribute to global warming.

2.3 Another promising solution for Indonesia is increased use of renewable energy sources --- "renewables" such as hydropower, biomass, geothermal, solar, and wind -- which are abundant and eco-friendly. Until recently, many considered renewables to be expensive and impractical without the provision of subsidies. However, electricity generated from renewable energy has been proven to be reliable in commercial operations world wide and at a cost that in many cases is competitive with the conventional alternatives. Even solar and wind power are now increasingly competitive on account of impressive gains made in the last two decades in lowering of capital costs and in raising the conversion efficiency and performance. Continued improvements in costs and performance will come as the overall market grows and from technological change. Yet, relative to the vast economic potential of renewable energy, the share of renewables in Indonesia's electricity generation is small at present. Development of small scale renewable power generation in particular can help improve the lot of Indonesia's rural population, many of whom will otherwise have to wait 30+ years to get electricity.

### Role for Small Scale Renewable Power

2.4 Indonesia's efforts to provide electricity to all its citizens poses a technical and cost challenge on account of its geography. Nearly 70 percent of Indonesia's population, of an estimated total of 195 million, lives in rural areas, comprising about 31 million households. The last census recorded 62,000 rural villages, of which 39,000 villages outside Java and Bali are dispersed across an archipelago comprising of over 13,600 islands and geographically spread over 5,100 kilometers from east to west and nearly 1,800 kilometers from north to south. Not only are the rural villages often scattered wide and far, so are the rural households within a village.

2.5 Because of the dispersed geography, the cost of supplying power by conventional means is very high, especially in islands other than Java-Bali. Outside Java-Bali, PLN's operations are sustained in the following three modes: (i) Seven small regional grids operate at low transmission voltages (150 kV or

lower) and, therefore, experience relatively high network losses. Further, these grids are supplied power by smaller scale power plants that are unable to exploit the economies of scale associated with large conventional power plants; (ii) Dozens of mini--grids are supplied by one or more interconnected diesel power plants in the 1 to 12 MW unit size range; (iii) There are a large number of isolated small diesel plant based operations -- in the 20 to 200 kW size range -- of which there are nearly 1,000 such isolated high cost systems in operations, many supplying power only for a few hours in the evening and night time. In aggregate, PLN owns and operates about 3,400 diesel plants scattered throughout Indonesia -- over 2,000 MW of diesel generating capacity -- as a primary means to supply power for rural electrification. Diesel is also the marginal fuel -- the fuel that is used to generate power to meet the last increments of demand -- in most of the seven regional grids outside Java-Bali.<sup>1</sup>

**2.6 Renewable energy, a superior alternative for small power generation** Whereas on Java-Bali PLN can maintain a large interconnected, efficient and modern power system that is profitable, its outside Java operations of necessity require numerous and small scale and isolated grids. In particular, the conventional power plants outside Java do not offer the benefit of scale economies that their larger counterparts on Java can provide. Renewable energy power generation, on the other hand, is well suited for small power generation and in a decentralized mode; it offers a cost effective and environmentally superior alternative. Further, since small renewable power generation can be situated close to the demand, the investment required for transmission lines is reduced significantly or eliminated, as are transmission losses. Overall, increased penetration of renewable energy power generation will help reduce the tremendous pressures on the Government budget for financing the subsidy associated with government-mandated rural electrification (RE) operations of PLN especially outside Java.

**2.7** The renewable energy resources for electricity power generation that have potential for development in Indonesia on a significant scale in the near-to mid-term are mini-hydro, biomass cogeneration<sup>2</sup>, and mini-geothermal, with typical sizes of 1-15 MW. An ESMAP study in Indonesia estimates the market potential of generation from **biomass residues** to be about 1,800 MW, of which about 500 MW is in Sumatera, 800 MW in Kalimantan and 380 MW in Java. Whereas the supply potential from such residues is far larger, these estimates also reflect the demand in proximity to the resource. The bulk of this potential is in: (i) sugar mills, where bagasse is used extensively in sugar processing, for steam and in-plant electricity production to meet the mill's process energy needs; (ii) in palm oil mills that use empty fruit bunches, fiber and shells for steam and power generation; and (iii) in the rubber, forestry and timber industry using waste products. In each case the amount of biomass residues far exceed the capacity of the mills to utilize them, so that disposal can be expensive, while posing added environmental problems. The utilization of Indonesia's substantial biomass residue resource potential in power generation will also help further the Government's goal of fostering energy conservation. The **geothermal** technical potential in Indonesia is estimated to be 16,000 MW, with about half in Java-Bali; the market potential, taking into account proximity to demand centers is substantially lower but still large. Moreover, mini-geothermal plants (under 10 MW) can be particularly viable for supplying small loads.

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<sup>1</sup> The cost of expanding coverage to a large fraction of rural households, using the conventional means of grid extensions and scattered diesel generators, is high, especially outside Java (Annex 2.1). The marginal costs of generation alone -- PLN's "avoided generation costs" -- for supply at medium voltage (MV), are estimated to be about US \$ 9.3/kWh for the seven regional grids outside Java, as high as US \$ 20.0/kWh in case of some of the diesel-based isolated units and mini-grids.

<sup>2</sup> *Indonesia: Prospects for Biomass Power Generation*, Report No. 167/94, ESMAP, World Bank.

**2.8 A role for the private sector** An attractive feature of small renewable power projects is that they are within the capacity of small and medium sized private sector developers, i.e., non-utility generators<sup>3</sup>. Therefore, they offer an avenue for greatly increasing the number of suppliers in the regional power markets; thereby creating competitive market-based pressures for more efficient utilization of energy resources and capital investment on part of all the suppliers in the power generation market. Thus, the promotion of small power generation projects utilizing renewable energy offers the Government a clear path to increasing private sector participation in energy markets, a matter of high priority for GOI as well as a matter of priority on the Bank's agenda.

**2.9** For some time to come, private sector interest in renewables will be more forthcoming for the relatively larger projects within the "small" project category. For example, in the case of mini-hydro, indications are that private developers will gravitate more towards the lucrative projects in the 5+ MW size range as a minimum size, and which can supply power to a regional grid in contrast to being connected to the much smaller scattered diesel grids, or displace PLN's isolated diesel operations.

**2.10** The private sector's interest in projects that serve regional grids outside Java-Bali makes it necessary for PLN to take the lead in developing the smaller -- typically 1 to 5 MW -- power plants in the more remote locations in Eastern Indonesia; these projects would displace some of PLN's highest cost diesel generation that impose a high subsidy burden. The proposed Eastern Indonesia Renewable Energy Project, under preparation, will finance several small mini-hydro and mini-geothermal PLN projects in remote areas of Eastern Indonesia and also provide for technical assistance to help PLN mainstream and sustain renewable energy development.

### **Government's Strategy**

**2.11** The Government of Indonesia (GOI) accords high priority to the participation of private operators and investors in power generation. In the case of large power projects, it has been successful in attracting world class independent power producers (IPP), with over 7,500 MW of power purchase agreements (PPAs) signed and over 2,500 MW of IPP capacity under construction at present. The Bank is assisting the Government to better define the rules for entry and competition within the market and define a process of applying these rules in a transparent manner to promote orderly and efficient development of the large power market.

**2.12** A key element of the Government's strategy for encouraging private sector participation in small power generation is the removal of a major stumbling block to the small power market development; the recent implementation (December 1995), in response to a covenant under the Bank-financed and ongoing Second Rural Electrification Project (Loan 3845-IND), of the published Small Power Purchase Tariff and a standard simplified power purchase contract governing the sales of electricity produced by small projects to PLN<sup>4</sup>. In this regard, Indonesia is a pioneer in promoting efficient development of private

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<sup>3</sup> The non-utility generation could be undertaken by a variety of entities, such as private firms, state-owned non-utility firms, NGOs, cooperatives, or even an independent joint utility-private enterprise.

<sup>4</sup> Ministry of Mines and Energy decree No. 1895.K/437/M.PE/1995, issued December 8, 1995, published in "Business News", issue January 12, 1996.



sector led small power through an improved policy and regulatory environment, and Indonesia can be successful in developing an efficient small power market if GOI and PLN stay the course during implementation. Whereas the small power purchase tariff applies to all small power projects selling to PLN, the Government recognizes that development of the small private power market will be predominantly led by small renewable power projects (para 2.8).

**2.13** GOI also recognizes the need to substantially increase the rate and scale of penetration of cost effective renewables as a means of ensuring high and environmentally sustainable rates of economic growth. Increased penetration of power generation from renewables will have a significant and positive impact on the environment by reducing local pollutants such as SO<sub>2</sub> as well as pollutants of global concern such as emissions of green house gases (GHG). To the extent that this development displaces kerosene consumption and diesel generation, it reduces the negative environmental impacts of transport, waste disposal and burning of these fossil fuels.

**2.14** Indonesia's experience to date with renewables power generation for decentralized rural electrification has been mainly a demonstration effort. The role of small renewables as a cost effective complement to power supply being fed to PLN's grids has been non-existent in the private sector and is minuscule in the case of PLN. Numerous studies, by agencies such as DGEED, PLN, and BPPT have demonstrated the significant potential of small renewable power. The time has now come for these projects to be developed within the framework of a least-cost rural electrification strategy, rather than as a series of individual projects undertaken on an *ad hoc* basis.

**2.15** A first step in formulating a cohesive strategy and development plan for small renewables has been taken with the completion of the Rural Electrification (RE) Master Plan. Financed under the Bank's first Rural Electrification Project (Loan 3180-IND), the RE Master Plan analyzed conventional options for grid extensions and use of scattered diesel generation to support isolated mini-grid operations to electrify the remaining unelectrified villages. Building upon this effort, under TA financed by the ongoing Second Rural Electrification Project (Loan 3845-IND), a Renewable Energy Development Plan is now under preparation. Specifically, readily available information on renewable energy resources -- mostly mini-hydro, biomass and mini-geothermal -- is being mapped onto the geographical information system (GIS) that was developed as part of the RE Master Plan effort, with a view to identifying spatial matches between cost effective renewable power supply potential and electricity demand. A primary objective of this TA is to prepare initial development plans for grid connected and decentralized small renewable energy generation especially to displace high cost decentralized diesel generation in rural areas off-Java.

### **Barriers to the Development of Small Renewable Power Projects**

**2.16** Key barriers to the development of small renewable power projects by the private sector are: (i) lack of accessibility to and high information costs about the resource as well as the technology; (ii) large pre-investment costs, relative to conventional energy projects; (iii) lack of medium-to-long-term debt financing that is essential to achieve financial viability of such projects that are capital intensive; and (iv) a playing field that is not level, especially the lack of fair and transparent rules for the pricing of power sales to PLN's grid, lack of specific regulations to control and oversee market access and entry, and weak pricing and contract enforcement mechanisms.

2.17 The proposed project design, in conjunction with the Bank's ongoing policy dialogue with the Government of Indonesia and PLN, directly addresses the barriers to private sector participation that are identified above:

- **Lack/high cost of resource information** Technical information about the potential sites -- such as streamflow records, geoscientific data on steam conditions, wind speeds data, solar insolation -- are very expensive to collect and take years of effort, and are generally the responsibility of one or more Government ministries. Without such essential information being readily available to the private sector, they would not be able to conduct even a pre-feasibility assessment for a potential project. A technical assistance component of the proposed project has been designed to help GOI and PLN prepare and make readily available resource information to the private sector. In case of the projects pre-identified for the proposed project pipeline (para 3.6), Bank managed grant-financed consultants worked closely with the prospective sugar and palm oil mill management and staff in helping them better understand the biomass resource potential and technical operating issues with deploying cogeneration systems and selling power to PLN.
- **High pre-investment costs** The pre-investment costs of conducting a pre-feasibility study, detailed feasibility analysis and engineering design are generally a much higher percentage of the installed cost of a small renewable power project than in the case of larger renewables or fossil fuel generation plants. The Project provides a cost sharing grant to the developers of the sub-projects to be financed under the proposed project, to lower these high pre-investment costs. For some of the sub-projects identified for the proposed project pipeline, Bank managed grant financed consultants have already helped to carry out the pre-feasibility studies and feasibility analysis.
- **Lack of term debt financing** Typically, the ratio of initial capital (equipment and civil works) costs to operating (labor, fuel and other inputs) costs is higher for small renewable projects compared to equivalent conventional thermal power plants<sup>5</sup>. Hence, the initial investment to be financed by debt or equity is far greater for small renewable projects than for comparable conventional projects. As a result, small renewable projects typically require debt financing to be amortized from 8 to 15 years in order for the debt amortization payments to match the developer's revenue stream. While successive financial sector reforms have removed most policy constraints on term lending, due to institutional weakness, at present, medium-to-long-term debt financing is available only to a select group of companies in Indonesia. In particular, small entrepreneurs and non-traditional projects are crowded out by larger and well established entrepreneurs and traditional projects.
- **Enabling regulatory environment** Experience strongly indicates that for the small power market to develop and flourish, an effective regulatory environment is needed to

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<sup>5</sup> For example, diesel-based projects have relatively low initial capital costs with high fuel costs, while biomass-based cogeneration projects have relatively high initial capital costs with virtually no fuel costs since the biomass to be used as fuel is a waste by-product that is readily available.

level the playing field against the monopoly power of the dominant utility to whom the power would be sold. Small power producers invariably are unable or unwilling to marshal the time and expense otherwise necessary to take on the utility in negotiating such deals<sup>6</sup>. Fortunately, with respect to this last barrier, Indonesia can be counted as a pioneer in having significantly lowered it.

**2.18 Published small power purchase tariff** Over the preceding few years, the GOI has undertaken significant energy pricing and market reforms. Introduction of the published small power purchase tariff and establishing PLN's obligation to buy power from other suppliers, on a "no negotiations basis", at a purchase price tied to PLN's "avoided cost" in various regional grids, and under a simple and standardized long term contract, represents a big step forward in promoting efficient development of the small power market for renewables. First, it opens up access to the power generation market to smaller project developers. Second, this approach ensures that only cost effective renewables are developed. Third, it facilitates the long-term commercial debt financing of such projects which depends critically on the terms of the long-term power purchase contract.

**2.19** Over the period August through October 1996, PLN solicited applications from qualified small power project developers by advertising the tariff and its major provisions in major regional newspapers. PLN's published small power -- defined as under 30 MW in Java and under 15 MW outside Java -- purchase tariff for renewable power is set at PLN's avoided cost in the respective regions (Annex 2.3). The initial responses of the private sector to this initiative -- referred to by PLN as the "PSKSK" tariff -- are encouraging particularly in Sumatera, Java and Sulawesi.

**2.20** The PSKSK initiative represents a major step in the removal of one of the single largest stumbling blocks to small renewables power development by the private sector. However, the prospects for this market -- size, scope, number of transactions, rate of growth, and efficiency -- and its sustainability over the longer term will depend upon PLN's ability and sustained commitment to implement this tariff driven by the spirit of achieving this objective. Some revisions and refinements to the power purchase contract may be required based upon an evaluation of the market experience, especially early-on. For this purpose PLN is implementing a monitoring system that will also facilitate Bank supervision of market developments. Successful implementation of the PSKSK initiative also requires close coordination, training and getting field management staff in PLN's regional units "on board". *An existing covenant (Loan 3845-IND) requires that PLN shall by June 30, 1998 (or such other date as may be agreed by the Bank), revise and publish the small power purchase tariff including the form of the small power purchase contract in accordance with the methodology agreed to by the Bank. This covenant would be reaffirmed with GOI during negotiations for the proposed project.*

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<sup>6</sup> Negotiations in the cases of small power contracts typically: (a) result in a protracted process; (b) inherently impose a higher and generally crushing burden on the small developers because of the asymmetry in information and expertise available to the two parties; and (c) introduce the risk of manipulation by both sides. Negotiated prices lower than PLN's avoided cost result in sub-optimal levels of investment in renewable energy, whereas prices higher than avoided cost would result in increasing the subsidy burden.

## Renewable Energy Without Subsidies

2.21 Notably absent from the list of the key barriers impeding renewable energy development (para 2.17) is “**high cost of renewable energy technologies**”, i.e., in selected niche areas, on a life-cycle basis, the economic cost of electricity produced by renewable energy resources is not more than the cost of the electricity from conventional power plants. As a result, in Indonesia and globally, there exists today a large market potential for small renewable power, such as mini-hydro, biomass cogeneration, mini-geothermal, and wind power, that can be sustained without any financial incentives, such as capital subsidies, interest rate subsidies, or preferred tax treatment<sup>7</sup>. While the development of these resources is potentially financially attractive to private sector developers, the four barriers identified above (para 2.17) come in the way of such development. In this situation, what is needed is the Government’s commitment and presence in: (i) improving the enabling environment -- informational, regulatory, financial; and (ii) for an initial period, providing assistance to reduce the pre-investment barriers. This approach -- not providing financial incentives or subsidies for investment but providing limited assistance for reducing and overcoming pre-investment barriers -- underlies the design of the proposed RESPP project in which there are no subsidies provided for the capital investment. Specifically, the GEF grant is utilized solely for capacity building, for future market development, lowering barriers related to resource information preparation and dissemination, and lowering high pre-investment costs.

## Past Bank Experience and Lessons Learned

2.22 **Overview.** The Bank has been active in Indonesia's power sector for twenty-five years during which time the Government has borrowed more than US\$ 4.7 billion in Bank loans and IDA credits to undertake 25 power projects (Annex 2.2). Despite some problems with implementation, past Bank-financed PLN projects have helped strengthen PLN's capabilities in almost every aspect of its operations. Over the last twenty-five years, the Bank has also engaged the Government and PLN in a dialogue on sector issues. In the 1970s and 1980s, this focused mainly on sector planning, tariff and organizational autonomy issues. In recent years, beginning with the Sumatera-Kalimantan Project in 1994, the Bank and Government have shifted their emphasis towards sector structure, private sector participation and regulation. The Bank is now supporting specific interventions where private sector participation is not readily forthcoming: transmission and distribution management and investment, sector expansion outside Java, renewable energy and demand side management, and rural electrification.

2.23 Taken altogether, these projects have assisted in the expansion of generation, transmission and distribution facilities and rural electrification and institutional development of PLN. The technical assistance provided by the Bank has also strengthened PLN's technical and management capabilities in engineering, project management capabilities, distribution and rural electrification planning and management, and corporate and financial planning. As a result of these efforts, PLN's implementation capacity and operational efficiency have increased significantly. The negative lessons largely concern implementation. Most projects have suffered delays due to extended procurement cycles. Technical

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<sup>7</sup> In the past many governments have and today some still continue to offer attractive financial incentives -- such as accelerated depreciation, subsidized interest rates, payments for capacity purchased that exceed the utility's avoided cost -- to private entrepreneurs and utilities to develop renewable energy resources. Frequently, such subsidies have distorted efficient resource allocation and undermined the sustainability of small renewable power. lead to over-investment in capital intensive technologies without necessarily maximizing energy (kWh), delivered to the grid.

assistance for institutional capacity building has in some cases fallen short of expectations due to limited absorptive capacity and inadequate supervision and ownership. However, all power projects completed to date have been rated satisfactory by OED.

**2.24 Experience with renewable energy** Given the Bank's limited involvement in renewable energy projects, there are no relevant Bank reports on past projects. Experience is limited to the ongoing IBRD/GEF-financed India Renewable Resources Development Project (Loan 3544-IN/Grant 2449-IN) and the Indonesia Second Rural Electrification Project. Relevant lessons learned from the India project are: (i) timely project implementation is facilitated by pipeline development, i.e., pre-identification and preparation of sub-projects; and (ii) private sector interest in Bank financing fades if the procedures they are required to use for procurement are not in line with normal commercial business practices and the process and disbursement of funds is not streamlined and fast.

**2.25 Experience with financial intermediation** Some of the lessons learnt from financial intermediation loans in Indonesia (Indonesia Financial Sector Development Ln. 3526-IN) and other countries are also relevant. This experience indicates that poor subloan recovery has been a problem, but that this risk can be reduced by: (i) selecting only the strong and committed commercial banks to participate in the Project; (ii) requiring that the private borrowers put in a significant amount of equity; (iii) ensuring quality at entry; and (iv) close portfolio monitoring. These principles have been incorporated in the Project design.

## 3. THE PROJECT

### Project Concept

3.1 The Renewable Energy Small Private Power (RESPP) Project aims to catalyze the creation of private sector markets for small-scale renewable energy power projects and to reduce the costs of PLN's rural electrification (RE) operations outside Java-Bali. The RESPP Project is a pioneering initiative, whose initial size is sufficiently large to establish a baseline penetration of such renewables while also providing a demonstration effect that can support a critical mass of private sector led projects, i.e., non-utility generation, that are sustainable on a commercial basis. In keeping with the project design concept, the project focus is on a few selected renewable resources. The technologies utilized are well proven, and the implementation and delivery modalities would be sustainable on a commercial basis. The private sector investments would be for the relatively larger projects within the category of small renewable projects, with lower risk and in less remote areas, that have high market potential, good renewable resource potential and are in proximity to demand centers/regional PLN grids that have high "avoided cost" of supply; in general, private sector investment is not expected in Eastern Indonesia at this stage (para 2.9). The project has a strong institutional focus as well.

### Project Objectives

3.2 The principal **national** objectives of the RESPP Project are to: (i) facilitate private sector led development of small renewable power projects selling electricity to a PLN grid on a commercially sustainable basis, within the framework of a least cost rural electrification strategy; (ii) promote environmentally sound energy resource development in Indonesia and reduce the energy sector's dependence on fossil fuels; and (iii) strengthen Indonesia's institutional capacity to sustain renewable energy development.

3.3 The **global** environmental objective of the RESPP Project is to mitigate emissions of CO<sub>2</sub> in Indonesia. The development of renewable energy sources for power generation would mitigate diesel consumption in power generation, and correspondingly mitigate CO<sub>2</sub> emissions.

### Measuring Project Performance

3.4 **Performance Indicators.** The key performance indicators for monitoring achievement of the Project objectives outlined above are: (i) the number and generation capacity (MW) of private renewable energy small power projects financed, which are measures of the extent of the private sector led development; (ii) subloan recovery rate, which is a measure of the extent to which the Project is successful in establishing a sustainable financing mechanism; (iii) availability of basic resource information about potential projects, which is an indication of the potential for future private sector led

projects; and (iv) diesel displaced, foreign exchange saved and CO<sub>2</sub> emissions reduced, which are inter-linked measures of the reduction of the dependence on fossil fuels as well as of the global environmental objective. Baseline levels and future target levels for each are shown in of Annex 3.1. *During negotiations, agreement would be sought on the proposed indicators and the target levels.*

## **Project Description**

3.5 The Project consists of renewable energy based small power generation projects that are organized into the (i) Investment component, and (ii) Technical Assistance.

3.6 Under the investment component, the projects will be owned and operated by private developers, who would sell their electricity to PLN under the published Small Power Purchase Tariff (PSKSK), and standardized power purchase contract (paras 2.18 and 2.19). While projects from all renewable resources are eligible to participate, a pipeline of 15-20 prospective biomass and mini-hydro power projects -- with about 60 percent of the installed generation capacity outside Java-Bali -- have been identified with the assistance of consultants supported by Bank-managed trust funds (Annex 3.2). Overall, most of the projects are in the 5-10 MW range (with an aggregate capacity of about 75 MW). For three of these projects ("Group 1"), the bulk of the pre-investment activities will have been completed by loan effectiveness, and they are expected to reach financial closure shortly after loan effectiveness; for about ten projects ("Group 2"), preliminary screening indicates that they have good prospects, but significant pre-investment activities will remain to be conducted after loan effectiveness. The remaining Group 2 projects would be identified in the first 18 months of the proposed Project.

3.7 Substantial resources have and continue to be devoted by the private developers as well as the Bank to complete preparations for these fifteen projects. Therefore, it is essential for the Government to ensure that for these pre-identified projects, PLN reserves the corresponding amounts of firm capacity purchases in the respective regions under its "obligation to purchase" in those regions, as provided under the PSKSK tariff (para 2.19). *During negotiations, agreement would be sought that the Government shall cause PLN to commit to purchase capacity under its PSKSK initiative for the projects to be supported under the proposed Project.*

3.8 The key barriers to the development of renewable energy power by the private sector (paras 2.16-2.17) are being addressed by a combination of (i) GEF grants, which would finance part (specifically, the incremental costs) of the information, transaction and pre-investment costs of the private sector developers (paras 3.11, 3.13, 3.17), and (ii) IBRD credit.

3.9 The private sector developers will finance their investments with a combination of equity and credit from commercial banks of their choosing -- the "Participating Banks (PBs)" -- for up to 15 years. Four PBs have been identified to date, of which two -- Bank Niaga and Bank Bali -- are private commercial banks; a third bank -- Bank Negara Indonesia (BNI) -- has been partially divested by the Government, and the fourth -- Bank Ekspor Impor Indonesia (Bank Exim) -- is State-owned. The PBs view these projects as an entry into an attractive niche market. None of these PBs would be appraised by the Bank, given that these commercial banks have been classified as financially sound (*sehat*) by BI<sup>1</sup>.

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<sup>1</sup> Annex 3.3 outlines BI's bank rating system for monitoring and classifying the financial health and overall soundness of state as well as private commercial banks. Any new PBs would also not be appraised by the Bank. All PBs would be required to maintain a *sehat* rating by BI.

The loans from the PBs to the developers would be at the prevailing interest rates for similar transactions, with the PBs taking responsibility for appraising developer requests for credit, and for bearing the commercial risk on the credit extended to a developer (para 3.22). The PBs, in turn, would re-finance 70 percent of the credit extended to the developers from the IBRD credit made available to them at market rates, under onlending arrangements through the Government of Indonesia (GOI). *During negotiations, agreement would be sought that, except as the Bank shall otherwise agree, GOI will not provide to the private developers, whether directly or indirectly, in cash or in kind, any loan, subsidy, grant, credit enhancement or financing of any kind other than the GEF grants and the credit extended by the PBs under the RESPP Project.*

**3.10 Technical Assistance** The TA components of the proposed project are individually identified by category and value in Table 3.1. Draft TORs for all components have been prepared in consultation with DGEED, and are contained in the Project Implementation Plan (PIP) report (para 3.39).

**Table 3.1: Allocation of Technical Assistance**

Category	Component	Value <sup>1/</sup> US\$ Millions
1. Engineering/ Implementation Support	o Project Support Group	1.5
	o Pre-investment Services	1.5
2 Institutional Development	o Resource Information	1.0
<b>Total</b>		<b>4.0</b>

<sup>1/</sup> Includes contingencies but excludes duties and PPN.

**3.11** Out of a total value of US\$4.0 million equivalent, 75 percent of TA is directed at **project implementation support** services. A Project Support Group (PSG), reporting to the Director-General (DG), DGEED, will be established to assist the private project developers with, *inter alia*: (i) environmental review of their projects to ensure compliance with World Bank requirements (para 3.41); (ii) implementation support in the form of limited technical advice to the project developers in the Project pipeline to facilitate the timely and proper implementation of the projects; and (iii) pre-investment activities, including administering GEF grants of \$100,000 per project for 15 projects to potential project developers to assist them with their pre-investment activities, such as pre-feasibility and feasibility studies<sup>2</sup>. The developers would commit to undertake the approved activities and the grants would be paid only **after** they had been undertaken, i.e., on a reimbursement basis; and (iv) provide regular progress reports for monitoring this component.

**3.12** The remainder 25 percent of technical assistance is for **institutional development**, specifically renewable energy resource information collection and dissemination to be undertaken by DGEED. This technical assistance will provide for consultants who will assist the Directorate of Electric Power Planning in the preparation of a strategy for renewable energy resource information collection and dissemination, and in implementing this strategy. The work will involve gathering geothermal, hydro, biomass resource data from available sources potential projects; evaluating their quality and adequacy; developing information systems to facilitate disseminating this information; and in providing the

<sup>2</sup> While the GEF grant of \$100,000 is a significant part of the pre-investment cost, it is negligible compared to the investment costs, which will typically be in the range of \$ 5-10 million per project.



information to interested developers. During negotiations, agreement would be sought that GOI would: (a) mobilize by January 1, 1998, consultants acceptable to the Bank to undertake the gathering of available information on renewable resources and evaluate their quality and adequacy, and to develop and implement a simple information system to facilitate the dissemination of this information, in accordance with terms of reference acceptable to the Bank; (b) by December 31, 1999, for about 35-50 projects, with an emphasis on projects outside Java, upgrade resource information to a level that is sufficient to enable the private sector undertake a pre-feasibility study that provides a reliable basis for making an investment decision and make this information accessible to the private sector on an equal access basis; and (c) prepare, by March 30, 2000, a plan, acceptable to the Bank, for an ongoing program of resource information collection and dissemination that would continue after the completion of this TA.

## Project Cost

3.13 The estimated project costs, inclusive of duties and taxes and physical and price contingencies is about US\$141.0 million equivalent. The total financing requirement, including interest during construction is about US\$141.0 million equivalent; with US\$78.5 million equivalent in foreign exchange and US\$62.5 million equivalent in local costs. Cost estimates are in September 1996 prices and utilizing an exchange rate of Rp2,341/US\$. Price contingencies for foreign costs are assumed to be 2.4 percent per year during the project implementation period, and for local costs at 8.7 percent per year. A summary of the project cost estimates is presented in Table 3.2.

**Table 3.2: Project Cost Summary**

	(US\$ million)			% Foreign Exchange
	Local	Foreign	Total	
1. Investments	33.7	71.5	105.2	68%
2. Technical Assistance	2.4	2.6	5.0	52%
<b>Base Cost</b>	<b>36.1</b>	<b>74.1</b>	<b>110.2</b>	<b>68%</b>
Duties and Taxes	23.2	0.0	23.2	0%
Price Contingencies	3.2	4.4	7.6	58%
<b>Total Project Cost</b>	<b>62.5</b>	<b>78.5</b>	<b>141.0</b>	<b>56%</b>
<b>Total Financing Required</b>	<b>62.5</b>	<b>78.5</b>	<b>141.0</b>	<b>56%</b>

Costs are based on an exchange rate of Rp. 2,341 per US\$

## Financing Plan

3.14 The financing plan is shown in Table 3.3. A proposed Bank loan of about US\$ 66.4 million equivalent, combined with a GEF grant of SDR zz.z (US\$ 4.0 million equivalent) would finance about 50 percent of the project cost. The GEF grant would finance the "incremental costs" of the RESPP Project (para 3.16)

**Table 3.3 Financing Plan**

	Local	Foreign	Total
	(Millions of US\$)		
IBRD	0.0	66.4	66.4
GEF	1.4	2.6	4.0
Private	32.2	9.4	41.7
Participating Banks	28.6	0.0	28.6
GOI	0.2	0.0	0.2
<b>Total Financing Required</b>	<b>62.5</b>	<b>78.5</b>	<b>141.0</b>

Inclusive of contingencies, duties and taxes and interest during construction.

3.15 Investment in the project will be financed by a combination of IBRD (\$66.4 million) and private funds (\$69.3 million). The pre-investment, project support (including strategic planning), and resource assessment costs will be financed by a combination of GEF (\$4 million) and private (\$1 million) funds.

3.16 The GEF grant would finance all the incremental costs of the proposed project. There is an incremental cost of \$4.0 million associated with the TA component of the project. At present, there is no private sector development of small renewable energy power projects in Indonesia. In the absence of the RESPP project, it is expected that private developers will begin to initiate small scale power projects, based on relatively standard technologies such as diesel, under the standardized small power purchase tariff; the costs associated with these activities form the baseline costs. The incremental cost (\$4 million) is the difference between the costs associated with the RESPP Project and the baseline costs.

### **Lending and Funds Allocation Arrangements**

3.17 The proposed Bank loan and GEF grant would be made to the Republic of Indonesia. The Bank loan would be provided to GOI, denominated as a standard multi-currency pool loan at the Bank's standard variable interest rate, with a commitment fee of 0.75 percent per annum or such other percentage as established by the Bank on the undisbursed amount under the Loan Agreement from time to time. The term would be 20 years, including five years grace period.

3.18 The Government would channel and allocate the loan proceeds to the PBs as follows:

(i) For the state-owned PBs, loan funds would be lent by MOF through a Subsidiary Loan Agreement (SLA), while for the private PBs, loan funds would go in the first instance from the Government to BI, through a separate SLA between MOF and BI. BI would then re-lend the loan funds to the private PBs through the respective Onlending Loan Agreements (OLAs) between BI and the respective PBs. *During negotiations, agreement would be sought that signing of: (a) the SLA between MOF and BI; (b) at least two SLA/OLAs between MOF/BI and the PBs, on terms and conditions acceptable to the Bank, would be conditions of loan effectiveness. Further, signing of an SLA/OLA, acceptable to the Bank, between MOF/BI and a PB would be a condition of disbursement of the IBRD loan for each PB.*

(ii) *During negotiations, agreement would be sought that in the event of a PB losing its "sehat" status: (a) BI would require the concerned PB to take remedial measures within a prescribed period of time to regain a "sehat" status; (b) BI would notify the Government, and the Government would notify the Bank that a situation has arisen that may require the reallocation of the uncommitted portion of funds previously allocated to the PB; and (c) in the event the PB fails to regain "sehat" status after the prescribed period, funds which have been allocated to the concerned PB but have not been committed, would on request of GOI, be reallocated to those PBs which continue to be classified as "sehat" and which have requests for subloans in excess of their allocations.*

(iii) *The loan allocation to each PB will be part of its SLA/OLA, and will be based upon the PB's estimates of its credit requirements for this Project. During negotiations, agreement would be sought that: (a) MOF/BI would amend, at the request of a PB and with the Bank's approval, the amount of such PB's loan allocation once every calendar year; and (b) each PB would pay to the Government, at the same rate as the Government would pay to the Bank, commitment fee on the portion of its loan allocation that has not been disbursed to the PB.*

(iv) Loan reallocations *During negotiations, agreement would be sought that in order to provide flexibility and to respond to unforeseen fluctuations in demand for credit, the Bank would approve, on the request of GOI, reallocation of funds from PBs that would not be able to utilize their allocated funds. This would happen for example, in the case of PBs that have: (a) fully committed, or are likely to fully commit, their allocation to their subborrowers; (b) used up all the loan funds available on a "first-come, first served basis"; and (c) have requests for additional subloans from their subborrowers. Further, upon the Bank's request, GOI would be willing to review the need for such reallocations. From the date of a reallocation, the PBs would be obligated to pay commitment fee on the undisbursed amount of their respective new allocations.*

### **Subproject Eligibility and Review**

3.19 In the proposed Project, the eligibility criteria for being considered for participation is that the subproject should qualify: (i) for sale of electricity to PLN under the PSKSK tariff, and (ii) as a renewable energy project under the terms of this tariff. In order to participate in the proposed Project, the developers of qualifying subprojects would prepare and submit credit applications to the PBs. After assessing the credit application, when a PB is satisfied that it is willing to extend credit to a qualifying developer, the PB would submit to the Bank for review the particular subproject, along with a copy of the subborrower's project plan. Annex 3.5 provides details of the information required in a subborrower's project plan.

3.20 *During negotiations, agreement would be sought that the Bank, after reviewing the PB's submission, will approve a particular subproject to participate in the Project, with the maximum amount of the IBRD loan to be extended to the particular subproject to be determined by the PB. The approval would be sent by the Bank to the PB, MOF and DGEED.*

3.21 **GEF grant authorization for pre-investment costs** *During negotiations, agreement would be sought that DGEED, based on the PSG's analysis and recommendations, will recommend to the Bank for review and clearance the projects, from those already pre-identified and any others subsequently identified (para 3.6), that are suitable for pre-investment support (para 3.11). The Bank would send the approval to MOF/BI and DGEED.*

## Onlending Terms

**3.22 GOI to PBs** Loan proceeds would be on-lent to the PBs in rupiahs for a term of 20 years including five years of grace. The onlending rate for the Bank loan to the PBs would reflect the market rate for and the PBs' cost of domestic term funds in Indonesia; this rate will be a variable interest rate equal to BI's domestic money market certificate (Sertifikate Bank Indonesia -- SBI). This rate would be adjusted on January 1 and July 1 of each year, based on the average of the three-month SBI maturity quotations, during the preceding six months. Further, on January 1 of each year, commencing January 1, 1998, the use of the three-month SBI rate as the onlending rate from GOI to the PBs would be reviewed with the objective of either ensuring that the three-month SBI rate appropriately reflects the cost of domestic term funds or agreeing on an alternative that does reflect this cost. In addition to interest payments, the PBs will pay to GOI a commitment fee of 0.75 percent per annum or at such other percentage rate as the Government shall pay to the Bank on the undisbursed amount of the Subsidiary Loan from time to time.

**3.23** While the Government would nominally bear the foreign exchange risk, in practice most of the risk would be borne by the PBs; the Government would be compensated for the cost of bearing this risk as the cost of funds from GOI to PBs includes an implicit premium reflecting market expectations regarding exchange rate changes<sup>3</sup>.

**3.24 PBs to subborrowers (small power producers)** *During negotiations, agreement would be sought that proceeds of the Bank loan, along with financing out of the PBs own resources, would be on-lent to the subborrowers by the PBs, at market interest rates. The terms for sub-loans would be up to 15 years. The terms and conditions of subloans would be freely negotiated between the PBs and subborrowers.*

**3.25 GEF Grant** *During negotiations, agreement would be sought that no fees for administering the GEF grant would be charged by GOI.*

## Procurement

**3.26** Procurement arrangements for the proposed project are summarized in Table 3.4. Procurement arrangements will follow the Bank's Guidelines for Procurement under IBRD Loans and IDA Credits, published in January 1995 and revised in January and August 1996. For the investment component where the project would provide funds to financial intermediaries for on-lending to the private sector, procurement for equipment and services under \$5 million equivalent would be undertaken by the project developer in accordance with established commercial practices in Indonesia, and which are acceptable to the Bank. Although the PBs do not have formal procurement requirements, they do require clients to justify their procurement decisions, and often requiring them to provide comparative price quotations. Under the proposed project, the PBs would require sub-borrowers to demonstrate that the procedures they use to procure goods and services are appropriate. The PBs would ensure that the goods and services are procured at reasonable prices, taking account of efficiency, economy, reliability, and other relevant factors such as terms of supplier credit, availability of spare parts, backup technical advice assistance, warranty arrangements.

<sup>3</sup> In Indonesia deposit rates are market-determined and capital flows are generally unrestricted.

**Table 3.4: Procurement Arrangements (Million of US\$)**

	International Competition Bidding (ICB)	Other / <sup>b</sup>	NBF / <sup>c</sup>	Total
Investments	22.6 (13.3)	90.2 (53.2)	-	112.8 (66.4)
Technical Assistance				
- Implementation Support / <sup>a</sup>		3.0 [3.0]	1.0	4.0 [3.0]
- Institutional Development / <sup>a</sup>		1.0 [1.0]	-	1.0 [1.0]
Taxes		-	23.2	23.2
<b>Total</b>	<b>22.6 (13.3)</b>	<b>94.2 (53.2)</b>	<b>24.2</b>	<b>141.0 (66.4)</b>
		<b>[4.0]</b>		<b>[4.0]</b>

Note: ( ) and [ ] are the amounts financed by IBRD and GEF respectively.

/a GEF grant financed

/b Goods and services to be procured by limited international bidding, established commercial practices or shopping procedures.

/c Not Bank-financed.

**3.27** The biomass cogeneration projects will involve procurement of (i) equipment such as boilers or turbo-generators, (ii) engineering and installation services, or alternately (iii) turnkey services for the design, supply and erection of the boilers and turbo-generators. It is estimated that about two-thirds the bid packages for equipment or services will be under \$5 million. The prospective mini-hydro projects typically consist of two procurement packages: (i) supply and installation of electro-mechanical equipment and electrical works and (ii) civil works. For these sub-projects, each procurement package is expected to be under \$5 million.

**3.28** It is proposed to make available the following options: (i) for individual procurement packages to be re-financed by Bank credit, that are valued under US\$ 5 million, established commercial practices acceptable to the Bank can be used, and (ii) for contracts valued in excess of US\$ 5 million, the Bank's procedures for International Competitive Bidding (ICB) are to be followed. Eligible local suppliers competing for the supply of goods under ICB procedures would be eligible for a preference in bid evaluation of 15 percent or the import duty, whichever is lower. For contracts estimated in excess of US\$ 10 million equivalent, a specific procurement notice would be required. The Bank would conduct *ex-post* reviews to ensure that procurement is economic and efficient. For this purpose between 5 and 10 percent of the contracts would be sampled.

**3.29** **Technical assistance** Consultants to be financed under the technical assistance component of the proposed project -- Table 4.1 -- would be selected in accordance with the Guidelines for the Selection and Employment of Consultants by World Bank Borrowers, January 1997 and use the Bank's standard contract for Consultant's Services. Specifically, the Quality and Cost-Based Selection (QCBS) process and procedures described therein would be utilized. All consulting services above US\$ 100,000 equivalent provided by firms, and above US\$ 50,000 equivalent to be provided by individuals would be subject to the Bank's prior review; further, for contracts below US\$ 100,000 equivalent provided by firms, and below US\$ 50,000 equivalent to be provided by individuals, there would be prior review of: (a) the terms of reference, (b) single-source selection of consulting firms, (c) assignments of a critical

nature, as reasonably determined by the Bank, (d) amendments to contracts for the employment of consulting firms raising the contract value to US\$ 100,000 equivalent or above; and (e) amendments to contracts for the employment of individuals raising the contract value to US\$ 50,000 equivalent or above. This would result in prior review of 100 percent of the TA contracts. All consulting assignments exceeding \$200,000 equivalent in contract value will have to be advertised separately to obtain expressions of interest. This would form the basis for the short list of qualified firms invited to bid.

**3.30** The most recent update of the Country Procurement Assessment Review (CPAR) was in January 1997. Most of the earlier inconsistencies between Bank procedures and GOI regulations no longer exist, with the exception of two essential contractual requirements of the Bank SBDs that are not yet accepted by GOI. These deviations relate to: (i) compensation (interest payments) to contractors for delays in payments beyond a stipulated period; and (ii) compensation to contractors for cost of delays beyond their control, including price escalation in case the bid validity period is extended by the implementing agency. Efforts to date at the working level to resolve these differences including possibly through the use of a supplemental letter to the Loan Agreement have not borne fruit. These issues are now under discussion between the Bank's senior management and the ministerial level in Indonesia.

## **Disbursement**

**3.31** Table 3.5 shows the allocation of loan and grant proceeds to each Category and the percentage of expenditures to be financed in each Category. For the investment component, the Bank loan would be disbursed against 70 percent of the sub-loan amount extended from time-to-time by the PBs to the project developers. This would cover about 75 percent of estimated foreign expenditures. For the Technical Assistance component, disbursements would be against 100% of expenditures. Withdrawal applications for consulting firm contracts above US\$100,000 equivalent and individual consultant contract cost above US\$50,000 equivalent would be based on the Bank's full documentation requirements; others would be on SOE procedures. Documents supporting SOE's would be retained by the PBs, project developers and DG-Budget, and made available for review by the Bank supervision missions.

**3.32** In order to facilitate timely disbursement, two Special Accounts (SA) would be maintained by MOF at BI, one for the IBRD loan and a second SA for the GEF grant, under terms and conditions satisfactory to the Bank. These SAs will be maintained in the name of Director General of Budget, Ministry of Finance, using established procedures as discussed in the following. After initial deposits by the Bank into these accounts, further replenishment would take place upon the Bank receiving applications for withdrawals from GOI/MOF. Replenishment to the SAs will be made on a monthly basis, or when 20 percent of an SA's balance has been used, whichever comes first.

**3.33** Under the investment component, disbursements from the SA for the IBRD loan would be triggered by the actions of the subborrowers. The PBs would disburse subloan credit to the subborrowers, based on a demonstration of their credit requirements, backed up by the documentation required by the PBs. The PBs would periodically submit a request for re-financing 70 percent of the subloan credit amounts to MOF, which would issue a payment authorization to BI. In turn, BI would transfer the loan funds from the SA to the PBs. MOF officials have indicated that the time from the receipt of the payment request at MOF from a PB to the time of payment by BI would be under two weeks. *Draft procedures and the supporting documentation to be utilized by MOF for disbursement of the IBRD loan are to be submitted by MOF by loan negotiations, and during negotiations, agreement would be sought on any changes thereof required to finalize the said procedures.*

**3.34 GEF Grant** Disbursement of the GEF grant for pre-investment costs (para 3.11) would be on SOE procedures, with the DG, DGEED to authorize the disbursement based upon the PSG verifying the documentation submitted by the project developers.

**3.35 Disbursement Schedule** The estimated disbursement schedule is shown in Annex 3.6. Disbursements are expected to be relatively small initially since only a limited number of developers will be able to achieve financial closure soon after effectiveness, and are expected to accelerate later as more developers begin to participate in the Project (para 3.6).

**Table 3.5: Allocation of Loan and Grant Proceeds**

Category	Amount of Loan and Grant Allocated (US\$ million)	Percent of Expenditures Financed
<b>A. IBRD Loan</b>		
Investment Component		
Sub-loans	66.4	Refinances 70% of the sub-loans made by participating banks.
<b>B. GEF Grant</b>		
Technical Assistance	4.0	100%
<b>Total</b>	<b>4.0</b>	

**Notes to table:**

1. Expenditures financed are exclusive of duties and taxes.
2. Investment Component: Private developers and/or participating banks finance US\$ 74 million

## Implementation

**3.36** A project implementation schedule depicting major milestone dates is contained in Annex 3.7. The schedule assumes a loan effectiveness date of September 1, 1997, project completion date of February 28, 2001, and a loan closing date of August 31, 2001. A more detailed implementation schedule by component of the proposed project is contained in the Project Implementation Plan (para 3.39). A Procurement Plan which details individual time line for each procurement activity from advertisement to contract signing is contained in Annex 3.8.

**3.37** Individual project developers will have primary responsibility for executing their power projects, including executing of the power purchase agreement with PLN, obtaining loans from commercial banks, and tendering for power plant equipment and construction. The Project Support Group (PSG) will be established at DGEED and will provide technical advice and assistance to developers on an as-needed basis. It will also be responsible for assisting the developers to prepare the required environmental analysis and plans.

**3.38 Accounting and Audit** The project accounts of all PBs and DGEED would be audited by independent auditors acceptable to the Bank. *During negotiations, agreement would be sought that DGEED and the PBs would submit their project audit reports to the Bank no later than six months after*

*the end of their respective fiscal years.* Specifically, the following audit reports would be required: (i) the SOE documentation and the SAs maintained by MOF; and (ii) the SOE documentation maintained by the PBs. All PBs would provide to the Bank, through BI, the relevant information on disbursements and balances and debt-service by each sub-borrower.

## **Project Management and Monitoring**

**3.39 Project Implementation Plan (PIP)** The project implementation and monitoring arrangements are detailed in a separate document that is available in the Project files. For the investment component, the PIP addresses the following principal elements: scope and objectives, critical success factors, strategy and implementation plan, project management structure, milestones, monitoring and reporting requirements, implementation schedule, and disbursement schedule. This report will serve as a key reference document for the PSG at DGEED and as well as for Bank supervision missions to monitor implementation progress and ensure achievement of the development objectives.

**3.40 Project Management** For the **investment component** project oversight will be provided by the Director-General (DG), DGEED who would be responsible for ensuring the development impact of this component. In undertaking this responsibility, the DG will largely rely on the Project Support Group (PSG) that reports to him and that will provide regular progress monitoring reports and flag issues requiring attention, and recommend corrective action (para 3.11). The PSG will have a Director acceptable to the Bank, with substantial and relevant international and Indonesian experience in biomass cogeneration systems, especially in sugar mills. The Director will be supported by an environmental expert acceptable to the Bank, and as necessary by short-term consultants, including a specialist able to assist potential subborrowers address the land acquisition and resettlement issues as per the Bank's requirements (paras 3.43-3.44) and guiding the project developers in reaching compliance. The Director would work on a full-time basis for approximately the first 24 to 30 months, and then on a part-time basis for the remainder of the four-year contract duration. *During negotiations, agreement will be sought that (i) PSG would be established in accordance with TOR, membership, staffing and resources acceptable to the Bank; and (ii) DGEED will undertake contracting in a timely manner so that the PSG can be mobilized no later than September 15, 1997.*

**3.41 Project monitoring** The Project's performance will be monitored by the PSG in DGEED, who will prepare and submit monthly progress reports, and by the Bank's supervision missions and there will be a mid-term review. Apart from monitoring and evaluating the progress towards meeting the performance indicators, since this is one of the first projects in Indonesia that may involve private purchase of land, any such purchases will also be closely monitored. The supervision schedule is shown in Annex 3.9. For this purpose it is essential that in the investment component the PSG has easy and timely access to the relevant Project information directly from the participating developers. *During negotiations, agreement would be sought that (i) DGEED would prepare an annual progress report; (ii) furnish it to Bank by December 31 in each year; (iii) review it with the Bank in a timely manner; and (iv) take the measures required to ensure the achievement of the Project's objectives.*

## **Environment**

**3.42** *During negotiations, agreement would be sought with the Government that all sub-projects will have to demonstrate environmental compliance of on-going operations with existing relevant national environmental regulations.* During project implementation a local environmental expert assigned to the Project Support Group (PSG), well versed with the sugar industry and acceptable to the Bank, will



prepare an Environmental Compliance Report (ECR) for each and will guide the project developers in reaching compliance. The outline for the ECR is given in Annex 3.10. In the event that the environmental mitigation measures required to achieve compliance, will need additional investments, the Participating Bank will ensure that the developer makes the appropriate financial commitments to implement these measures. The developer will also commit to obtaining all environmental permits required by Indonesian law, for new boiler installations, as needed. The environmental guidelines for mini-hydro projects are provided in Annex 3.11. Bank supervision missions will also review the environmental compliance reports.

### **Land Acquisition and Resettlement**

**3.43** All the Group 1 projects involve increase in the existing capacity of the sugar mills; additional land requirements are not envisaged at this stage. The status of the Group 2 sub-projects in regard to the need for land acquisition will only be known once the specific projects and then designs are finalized. *During negotiations, agreement would be sought on a policy framework governing land acquisition and resettlement issues associated with investment component.* Government would also be required to ensure that the PBs require the subborrowers to adhere to the agreed policy framework. A draft policy framework is contained in Annex 3.12.

**3.44** Where a sub-project results in acquisition of land which is not free of squatters, tenants, or other disputes, or where it is acquired by invoking eminent domain, Bank's OD 4.30 will apply. The Project Support Group (PSG), assisted by a consultant (para 3.40), will be required to prepare appropriate reports in compliance with the agreed policy framework governing land acquisition and resettlement and submit to the Bank together with other details for sub-project review (Annex 3.5). An outline of a detailed Resettlement Action Plan (RAP) is contained in Annex 3.13. Bank missions will also supervise the implementation of the RAPs where necessary.

## 4. PROJECT JUSTIFICATION

### Rationale For World Bank Involvement

**4.1 Links to Country Assistance Strategy** The Bank is committed to supporting renewable energy development in Indonesia, as stated in the Indonesia Country Assistance Strategy (CAS) that was presented to the Bank's Board on March 21, 1995, and the CAS Progress Report that was discussed on June 4, 1996. The proposed project design and implementation strategy typify the defining characteristics of the transition that is underway in the assistance strategy for Indonesia: (i) achieving poverty reduction through increased funding for regional development, and a shift towards smaller and regionally oriented projects targeted at reducing urban-rural disparities in the quality of life; (ii) striking the appropriate balance between public and private roles in energy distribution; and (iii) increased attention to the environment and sustainable management of resources.

**4.2 Links to Economic and Sector Work** The proposed project draws upon general economic and sector work related to renewable energy as well as analyses undertaken specifically for this project. In particular, the project design and strategy are consistent with the findings and recommendations in the Bank's rural energy policy paper, the Bank's report on the challenges Indonesia faces in sustaining development, and an *ESMAP* report on Indonesia's biomass potential<sup>1</sup>.

**4.3 Links to ongoing Bank activities in Indonesia** The Bank continues to actively support implementation of an efficient and sustainable Rural Electrification (RE) program, initiated in the RE I Project (Loan 3180-IND) and now through the successor RE II Project (Loan 38450-IND), primarily by financing extension of the various regional grids, and related institutional capacity building (para 2.14). The RESPP project will provide a means to continue the Bank's dialogue with the Government of Indonesia and to influence the implementation of a sustainable and environmentally sound RE development program, while encouraging private sector participation and the creation of commercial markets for alternative energy, and continue the process of improving the policy and institutional environment, all matters of high priority on the GOI's as well as the Bank's agenda.

**4.4 Rationale for credit component.** At present, in Indonesia, the commercial viability of lending for renewable energy small power projects has not been established, and no long-term (10-15 years) commercial bank financing is available for small entrepreneurs and non-traditional power project (para 2.17). Further, it is unlikely that the viability of this type of lending would be established on its own. The commercial banks lack familiarity with these types of transactions. The published small power purchase tariff and simple standard contract mechanism PLN has implemented (PSKSK mechanism (para 2.18)) is

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<sup>1</sup> *Rural Energy and Development: Improving Energy Supplies for 2 Billion People*, A World Bank Best Practice Paper, Report 15912-GLB, 1996; *Indonesia: Sustaining Development*, A World Bank Country Study, 1994; *Indonesia: Prospects for Biomass Power Generation*, Report No. 167/94, ESMAP, World Bank.

new, under which no transactions have taken place so far. Furthermore, the maturity structure of resources mobilized by commercial banks is relatively short and as much as such banks have to undertake term transformation, using short- and medium term resources to lend long term, which again involves a higher degree of risk for projects already perceived to be carrying a high degree of risk. Thus, the proposed project by providing long term resources to the banks will eliminate one element of the risk. It is expected that once our credit is utilized by banks for sound projects they would change their risk perception of privately owned renewable energy projects and in future they would be more willing to use their own resources.

### **Eligibility for GEF Support**

4.5 The RESPP project is fully consistent with the: (i) the guidance from the Convention of the Parties (COP), and (ii) GEF Operational Strategy, in particular with Operational Program 6, which has the aim of *promoting the adoption of renewable energy by removing barriers and reducing implementation costs*. The barriers targeted by this project are: (i) high pre-investment costs, (ii) lack of term debt financing, (iii) inadequate regulatory environment, and (iv) lack/high cost of resource information (paras 2.16 -2.17).

### **Alternatives To RESPP Project**

4.6 The baseline alternative to the RESPP project is the business-as-usual scenario under which: private sector development of small renewable energy power projects would be greatly inhibited. The costs of this baseline alternative were used, *inter alia*, to develop the incremental costs (para 3.16). This baseline scenario is also used in the least-cost analysis.

### **Fiscal Impact Analysis**

4.7 Since the investment component of the proposed project is to be executed entirely by the private sector, there are no public expenditures for this purpose. While there is a small element of subsidy in the Project, this is exclusively for TA, and this is being funded entirely by GEF grants. Further, the commercial risk of the subloans to the private producers is being borne entirely by the commercial banks. Thus, the only possibility of any adverse fiscal consequences would arise from a default by a participating bank (PB) on its loan obligation to the GOI, which is considered unlikely since the PBs have been classified as financially sound by BI, and assessed to be among the well-managed banks in Indonesia. Hence, the proposed Project would not have any adverse fiscal consequences for the Government.

### **Project Benefits**

4.8 **Least-cost analysis** The private developers will be selling electricity to PLN at a tariff that reflects PLN's avoided economic costs. This establishes that the financial costs of the profit-making private developers will be less than PLN's economic costs of power generation. By itself this result does not establish that the private developers' economic costs are less than PLN's economic costs, given the possibility of a divergence between the developers' financial costs and their economic costs of production, arising from subsidies or other financial incentives. However, there are no such subsidies/incentives being offered to the private developers to produce electricity from renewable energy. Thus, the financial costs of the private developers are close to their economic costs. It follows that the economic costs of the private developers are less than PLN's economic costs, i.e., the power produced under this Project represents the least-cost option.

#### 4.9 **Benefits** The proposed Project will provide:

- **Direct economic benefits** The direct economic benefit is the electricity produced and sold by the facilities financed by this Project.
- **Local environmental benefits** A condition for private developers to participate in the proposed Project is that their facilities meet all existing national environmental standards, and not just those related to the power generation aspect of their business (para 4.54). Since many of the potential participants are not yet in compliance with these standards, the proposed Project will lead to local environmental benefit associated with coming into compliance with the standards.
- **Global environmental benefits** There are global environmental benefits from the reduction in CO<sub>2</sub> emissions (about 10.0 million tons) as a result of the switch from fossil fuels to renewable energy<sup>2</sup>. This mitigation in emissions is the rationale for the GEF grant.
- **Regional development benefits** About 60 percent of the generation capacity installed by the private developers will be located outside Java.

4.10 **Cost-benefit analysis** In the cost-benefit analysis, only the direct economic benefits have been taken into account because there are no reliable estimates of the other three types of benefits. In particular, while the value of the GEF grant could provide an estimate of the global environmental benefits<sup>3</sup>, as measured by the international community's willingness-to-pay (WTP), in the proposed Project, the GEF grant is for TA only, not for any investment. The direct economic benefits are derived from the estimates of the consumers' WTP for the electricity. Based on this analytical framework, the internal economic rates of return (IERR) for the biomass projects are typically above 50% (Annex 4.1).

4.11 The financial returns to the private developers are lower than the IERR because (i) the developers have to pay duties and taxes that are excluded from the economic analysis, and (ii) the developers' revenue streams reflect only PLN's avoided costs, which significantly lower than the WTP used in the cost-benefit analysis as the measure of benefits. The developers' nominal financial rates of return are estimated to be above 25% while market interest rates are about 18%.

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<sup>2</sup> The estimates of the emissions avoided include both the emissions avoided as a result of the units directly installed under the RESPP project ("project effect") -- about 6.3 million tons of CO<sub>2</sub> -- as well as the acceleration of market penetration in Indonesia ("programmatic effect") as a result of the RESPP project -- about 3.7 million tons of CO<sub>2</sub>. With a total GEF grant of \$4.0 million, the unit cost of abatement is about \$0.40/ton CO<sub>2</sub>, including project and programmatic benefits, and about \$0.65/ton CO<sub>2</sub>, when only project benefits are considered. The primary reason for these low abatement costs in the proposed Project is that the GEF grant is for TA only, and not for investment.

<sup>3</sup> Bank guidelines (OP 10.04, Paragraph 8 (revised September, 1994)) specifically include global environmental benefits as a component of a project's benefits.

## Project Risks and Sensitivity Analysis

**4.12 Risks and steps to mitigate risks** The Project faces four implementation risks that could potentially adversely affect the objective of private sector led development of small renewable power projects (Objective A - Annex 3.1):

- There are risks that, for a variety of reasons, such as lack of familiarity with the technology/resource, perceived problems in dealing with PLN, or high transaction costs, private sector developers are either not interested in participating in the Project or that there will be some delays in their participation. These risks have been minimized during Project preparation by pre-identifying a large number of potential participating developers (Annex 3.2). Further, PLN will reserve adequate capacity to purchase power from the participating developers (para 3.7). In addition, during Project implementation, the developers will be provided GEF-funded grants of \$100,000 each to cover part of their pre-investment costs, and thus increase their interest in undertaking the pre-investment activities. Nevertheless, some of the potential participants will either drop out or delay their participation, and this is reflected in the performance indicator related to participation (Annex 3.1) and the disbursement schedule. Thus, these risks are not expected to have a significant adverse affect on the Project's outcome.
- There is a risk that commercial banks would not be interested in providing credit to the private sector developers. This risk has been minimized during Project preparation by pre-identifying four strong commercial banks that have expressed a strong interest in participating in this Project (para 3.9) -- which they view as an attractive niche market -- and have already begun initial discussion with the potential participating developers. Thus, this risk is not expected to have a significant adverse affect on the Project's outcome.
- There is a risk that the subloan recovery by the participating banks will be poor, which would adversely affect the establishment of a sustainable system of financing renewable energy small private power projects. This risk has been minimized during project preparation by requiring that the participating banks be classified as *sehat* (financially sound) by BI, and indeed the four participating banks identified to date are among the select group of the strongest commercial banks in Indonesia with good credit discipline. During project implementation, these strong banks will utilize their standard appraisal criteria in making subloans, thus assuring quality at entry. A key factor -- specific to the context of the proposed Project -- that would greatly help mitigate the risk of subloan recovery is that the subprojects are characterized by a single source of revenue that is based on the off-take arrangements spelled out in the power purchase contract between a subborrower and PLN. This would allow the PB to attach the revenue stream early on in the event of a default by a subborrower; there are ample precedents for such attachments in the much more complex and large scale financings associated with the larger private power plants being developed worldwide by independent power producers (IPPs). Finally, the actual subloan recovery rates will be closely monitored (Annex 3.1).
- There are potential technical, implementation and operational risks associated with the renewable energy technologies utilized by the private sector. Steps have been taken during Project preparation to minimize these risks by limiting technology choices to those that have already been proven under actual operating experience in Indonesia or other developing

countries. Further, during Project implementation, the PSG will be available to provide technical and operational assistance on an as-needed basis. Thus, these risks are not expected to have a significant adverse affect on the Project's outcome.

**4.13 Sensitivity analysis** While the risks identified do affect the number of projects undertaken by the private developers during and after the Project, they do not affect the IERR of the projects undertaken. Thus, there is no need to analyze the sensitivity of the IERR for these risks.

### **Post-project Sustainability and Participation**

**4.14 Post-Project Sustainability** The proposed Project will lead to a long term sustainable renewable energy small power sector. For the **private developers**, the demonstration effect of commercially viable private projects included in the proposed Project will stimulate further private sector participation; some international developers have already expressed an interest in undertaking small renewable power projects in Indonesia. In addition, sustainability will be enhanced as a consequence of the strengthening of the regulatory framework that is ongoing under the broader agenda of sectoral reform. Under the Project, developments in the small power market will be monitored and, if necessary, the implementation rules and regulations supporting the published small power purchase tariff would be revised as appropriate. This supportive regulatory framework, coupled with resource assessments that would be made available to the private sector are expected to lead to financial viability in the medium term. The **participating banks** see a promising opportunity and growth market for their services, their interest having been vetted by the broader ongoing developments associated with the much larger independent power projects (IPPs) that are dominated by off-shore financing. This Project provides them with an entry into a lucrative new line of business.

**4.15 Participation** The primary stakeholders in the project are: private sector small power project developers, industry associations, PLN, Directorate General of Electricity and Energy Development, the Planning Agency (BAPPENAS), and the Ministry of Finance. All stakeholders have been and continue to be involved to varying degrees in project preparation. A well-attended public launch meeting, co-sponsored by the Ministry of Energy and the Chamber of Commerce was held in March 1995 to publicize and discuss the RESPP project. Since then regular meetings have been held with industry associations such as the Sugar Council and its members and the palm oil industry to stimulate the interest of their members in biomass cogeneration projects and to help them prepare specific projects for the pipeline. As a consequence of these efforts, consultants financed by Bank-managed trust funds have already identified a number of potential power projects that, who have been classified into two groups: Group 1 (three projects) whose financing plans are in an advanced state of development, and Group 2 (about 10 projects), that have undergone screening and pre-feasibility analysis and whose business plans are now being initiated. During project implementation, the PSG and the Bank's supervision missions will maintain contacts with all the key stakeholders and seek their participation in resolving any implementation difficulties that may arise.

## **5. AGREEMENTS TO BE REACHED AND RECOMMENDATION**

### **Agreements To Be Reached With the Borrower**

5.1 The agreements to be sought with the Government of Indonesia during negotiations are:

- (i) Terms and conditions of the BI Subsidiary Loan Agreement (para 3.18);
- (ii) Terms and conditions of the respective Onlending Agreements for the private PBs and Subsidiary Loan Agreements for the State owned PBs (paras 3.18 and 3.22);
- (iii) Terms and conditions of the Subloan Agreements between PBs and the private developers (para 3.24);
- (iv) Terms and conditions for the authorization and channeling of GEF subgrants (paras 3.21 and 3.25);
- (v) Loan allocation and reallocation amounts and procedures for the PBs (para 3.18);
- (vi) No additional Government finance or support for the private developers (para 3.9);
- (viii) Performance indicators to be utilized for monitoring (para 3.4);
- (ix) Environmental review of projects (para 3.42);
- (x) Principles governing land acquisition and resettlement for the investment component (para 3.43);
- (xi) DGEED project monitoring (para 3.41);
- (xii) Borrower shall: (a) undertake the gathering of available information on renewable resources and evaluate their quality and adequacy, develop and implement a simple information system to facilitate the dissemination of this information, in accordance with terms of reference acceptable to the Bank; (b) prepare, by March 31, 2000, a plan, acceptable to the Bank, for an ongoing program of resource information collection and dissemination that would continue after the completion of this TA. (para 3.12);

- (xiii) With respect to the technical assistance consultancy contract for the Project Support Group (PSG), that: (i) PSG would be established in accordance with TOR, membership, staffing and resources acceptable to the Bank; and (ii) DGEED will undertake contracting in a timely manner so that the PSG can be mobilized no later than September 15, 1997 (para 3.40);
- (xiv) **Borrower shall ensure that BI shall inform the Borrower, and the Borrower inform the Bank, that a situation has arisen that may require the reallocation of the uncommitted balance of funds allocated to a PB if that PB fails to meet BI's requirements for "sehat" classification (para 3.18);**
- (xv) **Borrower shall ensure that the PBs shall:**
  - (a) utilize the specified subproject eligibility criteria and process (paras 3.19 -3.20)
  - (b) take reasonable steps to ensure that the goods and services procured by the subborrowers are at reasonable prices taking account of efficiency, economy, reliability and other pertinent factors (para 3.26); and
  - (c) submit their project audit reports to the Bank no later than six months after the end of their respective fiscal years (para 3.38).
- (xvi) **Borrower shall ensure that PLN shall:**
  - (a) by June 30 of each year, starting in 1998 (or such other date as may be agreed by the Bank), revise and publish the small power purchase tariff including the form of the small power purchase contract in accordance with the methodology agreed to by the Bank (para 2.20).
  - (b) Commit to purchase capacity under its PSKSK initiative (small published power purchase tariff) for the projects to be supported under the proposed Project (para 3.7)

### **Condition of Effectiveness**

5.2 The condition of loan effectiveness is:

- (a) Execution of subsidiary loan agreement between MOF and BI, and at least two SLAs/OLAs between MOF/BI and the PBs, which include provisions governing the channeling of GEF grant funds, satisfactory to the Bank (para 3.18).

### **Actions to be taken before Withdrawal of Loan and Grant Proceeds**

5.3 The conditions of disbursement for each PB are:

- (a) signing of an SLA/OLA between MOF/BI and the PB, satisfactory to the Bank (para 3.18);



- (b) obtaining prior authorization from the Bank for the subborrower (para 3.20);

**Recommendation**

5.4 With the above agreements and conditions, the proposed project is suitable for a loan of US\$66.4 million equivalent and a GEF grant of SDR .xxx million (US\$4.0 million equivalent), to the Republic of Indonesia.

**INDONESIA****RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT****Estimated Costs and Financing Plan**  
(US\$ million)

	Local	Foreign	Total
1. Investments	33.7	71.5	105.2
2. Technical Assistance	2.4	2.6	5.0
<b>Base Cost</b>	<b><u>36.1</u></b>	<b><u>74.1</u></b>	<b><u>110.2</u></b>
Duties and Taxes	23.2	0.0	23.2
Price Contingencies	3.2	4.4	7.6
<b>Total Project Costs</b>	<b><u>62.5</u></b>	<b><u>78.5</u></b>	<b><u>141.0</u></b>
<b>Financing Plan:</b>			
IBRD	0.0	66.4	66.4
GEF	1.4	2.6	4.0
Private	32.2	9.4	41.7
Participating Banks	28.6	0.0	28.6
PLN/GOI	0.2	0.0	0.2
<b>Total</b>	<b><u>62.5</u></b>	<b><u>78.5</u></b>	<b><u>141.0</u></b>

**INDONESIA**  
**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**

**Procurement and Disbursement**  
**A. Summary of Procurement Arrangements**  
(US\$ million)

	Procurement Method			Total
	International Competitive Bidding	Other / <u>b</u>	N.B.F / <u>c</u>	
<b>Investments</b>	22.6 (13.3)	90.2 (53.2)		112.8 (66.4)
Technical Assistance				
- Implementation Support/ <u>a</u>		3.0 [3.0]	1.0	4.0 [3.0]
- Institutional Development / <u>a</u>		1.0 [1.0]		1.0 [1.0]
<b>Taxes</b>		-	23.2	23.2
<b>Subtotal</b>	<b>22.6</b> <b>(13.3)</b>	<b>94.2</b> <b>(53.2)</b>	<b>24.2</b>	<b>141.0</b> <b>(66.4)</b>
		<b>[4.0]</b>		<b>[4.0]</b>

Note: Terms in ( ) and [ ] are amounts financed by IBRD and GEF, respectively

/a GEF grant financed

/b Goods and services to be procured by limited international bidding, established commercial practices or shopping procedures

/c Not Bank financed

**INDONESIA**

**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**

**B. Disbursement Arrangements**

Category	Amount of Loan and Grant Allocated (US\$ mill. equiv.)	Percentage of Expenditures to be Financed
<b>A. IBRD Loan</b>		
<b>Investment Component</b>	66.4	Refinance 70% of the sub-loans made by participating banks
Sub-loans		
<b>Total</b>	<b>66.4</b>	
<b>B. GEF Grant</b>		
<b>Technical Assistance</b>		
Small Private Power Component	4.0	100%
<b>Total</b>	<b>4.0</b>	

1 Expenditures financed are exclusive of duties and taxes

2. Private developers and/or participating banks finance US\$ 74 million

**Estimated Disbursements (\$million)**

Bank Fiscal Year		1998	1999	2000	2001	2002
IBRD	Annual	2.0	18.0	25.0	15.0	6.4
Loan	Cumulative	2.0	20.0	45.0	60.0	66.4
GEF	Annual	0.5	1.0	1.5	0.5	0.5
Grant	Cumulative	0.5	1.5	3.0	3.5	4.0

**INDONESIA**

**Renewable Energy Small Private Power Project**

**TIMETABLE OF KEY PROJECT PROCESSING EVENTS**

- |  |  |
|--|--|
| (a) Time taken to prepare the project: | 2 years <sup>1</sup>   |
| (b) Prepared by:                       | Private developers, but mostly with assistance from Bank-managed grant financed consultants- local and foreign |
| (c) First Bank mission:                | June 1994  |
| (d) Appraisal mission departure:       | May 1996; Post appraisal November 1996   |
| (e) Negotiations:                      | March 1997   |
| (f) Planned date of effectiveness:     | September 1997   |
| (g) List of relevant PCRs and PPARs:   | Loan 3180-IND, Rural Electrification ICR<br>Date: December 1995, Report No. 15210                              |

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<sup>1</sup> Project processing took more time than the norm for power projects in Indonesia, since preparation for this project has led the Bank's power operations into new areas, renewable energy, private sector, -- that entailed the laying of considerable ground work to collect the baseline data, and to seek out stakeholder views and commitments. Further, there is no single agency/Ministry that has as its mandate the filling of this preparatory void. In addition to ensuring quality at entry, the additional time was required to pre-identify the project pipeline in the private power component; a process that could normally have been undertaken following loan effectiveness, but that would also delay actual implementation.

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The report is based on an appraisal mission undertaken in June 1996 and a post-appraisal mission in November 1996 comprising Mr. Arun P. Sanghvi (Task Manager), Mr. Subodh Mathur (consultant), and Mr. Anil Cabraal (ASTAE). Peer reviewers were Messrs./Mmes. Magdalena Manzo (SA2EI), Khalid Siraj (FSD), and Ernesto Terrado (IENPD). The GEF external technical reviewer was Mr. Gerry Braun. Mr. Jean-Michel Severino, VP (EAP), Mrs. Marianne Haug, Director (EA3DR) and Mr. Peter R. Scherer, Division Chief (EA3IP) have endorsed the project.

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## Status of Bank Group Operations in Indonesia IBRD Loans and IDA Credits in the Operations Portfolio

Project ID	Loan or Credit No.	Fiscal Year	Borrower	Purpose	Original amount in US\$ millions			Undisbursed	Difference between expected and actual disbursements <sup>a</sup>
					IBRD	IDA	Cancellations		
Number of Closed Loans: 149/Credits: 48									
<u>Active Loans</u>									
ID-PE-3923	L29320	1988	GOI	Jabotabek Urban Transport	150.00			6.25	6.25
ID-PE-3873	L31580	1990	GOI	Second Secondary Education	154.20			23.19	23.19
ID-PE-3960	L32090	1990	GOI	Gas Utilization	86.00			36.69	36.69
ID-PE-3868	L32190	1990	GOI	Second Jabotabek Urban Development	190.00			30.10	29.46
ID-PE-3977	L32460	1991	GOI	Third Jabotabek Urban Development	61.00			19.88	19.02
ID-PE-3959	L32820	1991	GOI	Fertilizer Restructuring	221.70		0.24	10.30	9.14
ID-PE-3981	L33020	1991	GOI	Provincial Irrigated Agriculture Dev.	125.00		20.50	20.59	41.09
ID-PE-3943	L33040	1991	GOI	East Java/Bali Urban Development	180.30			22.08	22.08
ID-PE-3912	L33050	1991	GOI	Yogyakarta Upland Area Development	15.50		1.30	1.71	3.01
ID-PE-3922	L33400	1991	GOI	Sulawesi-Irian Jaya Urban Development	100.00			8.08	6.22
ID-PE-3975	L33490	1991	GOI	Power Transmission	275.00		103.40	12.32	115.72
ID-PE-4002	L33850	1991	GOI	Technical Assistance for Infrastructure	30.00			9.27	9.27
ID-PE-3928	L34020	1992	GOI	Agricultural Financing	106.10			48.79	45.49
ID-PE-3966	L34310	1992	GOI	Third Non-Formal Education	69.50			9.85	1.65
ID-PE-3940	L34480	1992	GOI	Primary Education Quality Improvement	37.00			19.14	12.14
ID-PE-4012	L34540	1992	GOI	BAPEDAL Development	12.00			1.20	0.20
ID-PE-3860	L34640	1992	GOI	Treecrops Smallholder	87.60			41.53	19.18
ID-PE-3997	L34820	1992	GOI	Fourth Telecommunications	375.00			208.02	58.02
ID-PE-3949	L34900	1992	GOI	Third Kabupaten Roads	215.00			2.35	2.35
ID-PE-3969	L34960	1992	GOI	Primary School Teacher Development	36.60			13.36	9.56
ID-PE-3916	L35010	1992	GOI	Suralaya Thermal Power	423.60		100.00	121.33	27.73
ID-PE-3970	L35260	1993	GOI	Financial Sector Development	307.00		39.81	41.88	81.69
ID-PE-3914	L35500	1993	GOI	Third Community Health & Nutrition	93.50			45.70	6.45
ID-PE-4006	L35790	1993	GOI	E. Indonesia Kabupaten Roads	155.00			31.79	17.79
ID-PE-4009	L35860	1993	GOI	Integrated Pest Management	32.00			22.28	13.28
ID-PE-3999	L35880	1993	GOI	Groundwater Development	54.00			35.62	4.52
ID-PE-4018	L35890	1993	GOI	Flores Earthquake Reconstruction	42.10			7.38	7.38
ID-PE-4007	L36020	1993	GOI	Cirata Hydroelectric Phase II	104.00			76.09	56.29

Project ID	Loan or Credit No.	Fiscal Year	Borrower	Purpose	Original amount in US\$ millions			Undisbursed	Difference between expected and actual disbursements <sup>a</sup>
					IBRD	IDA	Cancellations		
ID-PE-3990	L36290	1993	GOI	Water Supply & Sanitation for Low Income	80.00			55.23	25.23
ID-PE-3985	L36580	1994	GOI	National Watershed Mgmt and Consvation	56.50			47.80	6.50
ID-PE-3945	L37120	1994	GOI	Second Highway Sector Investment	350.00			236.51	66.51
ID-PE-3952	L37210	1994	GOI	Skills Development	27.70			21.10	18.40
ID-PE-3998	L37260	1994	GOI	Surabaya Urban Development	175.00			142.84	44.74
ID-PE-4020	L37320	1994	GOI	Fifth Kabupaten Roads	101.50			51.93	0.43
ID-PE-4010	L37420	1994	GOI	Dam Safety	55.00			44.37	10.87
ID-PE-3890	L37490	1994	GOI	Semarang-Surakarta Urban Development	174.00			133.80	19.90
ID-PE-4017	L37540	1994	GOI	University Research for Graduation Study	58.90			46.05	8.15
ID-PE-3937	L37550	1994	GOI	Integrated Swamps	65.00			52.58	8.58
ID-PE-3910	L37610	1994	GOI	Sumatera & Kalimantan Power	260.50			242.11	55.61
ID-PE-3954	L37620	1994	GOI	Java Irrigation Improvements and Wtr Resour	165.70			130.35	24.45
ID-PE-3984	L37920	1995	GOI	Land Administration	80.00			70.42	9.60
ID-PE-4019	L38010	1995	GOI	Second Accountancy Development	25.00			21.69	11.19
ID-PE-3988	L38250	1995	GOI	Second Professional Resource Development	69.00			50.40	1.40
ID-PE-3979	L38450	1995	GOI	Second Rural Electrification	398.00			366.08	88.78
ID-PE-3951	L38540	1995	GOI	Kalimantan Urban Development	136.00			105.37	25.37
ID-PE-3972	L38860/6	1995	GOI	Second Agriculture Research Management	63.00			59.51	-1.49
ID-PE-3968	L38870/6	1995	GOI	Book & Reading Development	132.50			129.66	-2.80
ID-PE-34891	L38886	1995	GOI	Village Infrastructure	47.10			24.22	-22.88
ID-PE-4001	L39046	1995	GOI	Telecommunications Sector Modernization	325.00			324.50	-0.50
ID-PE-3965	L39050/6	1995	GOI	Fourth Health	88.00			86.35	-1.60
ID-PE-39754	L39136	1995	GOI	Second Technical Assistance for Infrastructur	28.00			28.00	0.00
ID-PE-3978	L39720	1996	GOI	Industrial Technology Development	47.00			46.00	7287.90
ID-PE-4021	L39780	1996	GOI	Second Power Transmission and Distribution	373.00			373.00	0.00
ID-PE-4003	L39790	1996	GOI	Second Teacher Training	60.40			59.37	7.87
ID-PE-39643	L39810	1996	GOI	STD/AIDS	24.80			24.30	3.50
ID-PE-4008	L39840	1996	GOI	Nusa Tenggara Agriculture Development	27.00			26.20	1.90
ID-PE-4011	L40070	1996	GOI	Sulawesi Agriculture Area Development	26.80			25.80	0.50
ID-PE-4014	L40080	1996	GOI	Kerinci Seblat ICDP	19.10			18.20	0.60
ID-PE-39312	L40170	1996	GOI	Second E. Java Urban Development	142.70			142.70	18.90
ID-PE-41896	L40300	1996	GOI	Human Resource Capacity Building	20.00			20.00	1.00
ID-PE-37097	L40420	1996	GOI	E. Java Junior Secundaraya Education	99.00			99.00	2.50
ID-PE-4004	L40430	1996	GOI	Higher Education Support	65.00			65.00	3.00
ID-PE-4016	L40540	1996	GOI	Strategic Urban Roads	86.90			86.90	3.00
ID-PE-3987	L40620	1997	GOI	C. Indonesia Secondary Education	104.00			104.00	0.00
ID-PE-41894	L40950	1997	GOI	Sumatra Secondary Education	98.00			98.00	0.00
ID-PE-40521	L41000	1997	GOI	Second Village Infrastructure	140.10			140.10	0.00

Project ID	Loan or Credit No.	Fiscal Year	Borrower	Purpose	Original amount in US\$ millions			Difference between expected and actual disbursements*
					IBRD	IDA	Cancellations	
ID-PE-36053	L41050	1997	GOI	Second Sulawesi Urban Development	155.00		155.00	0.00
ID-PE-4026	L41060	1997	GOI	Railway Efficiency	105.00		105.00	0.00
ID-PE-42540	L41250	1997	GOI	Iodine Deficiency Control	28.50		28.50	0.00
ID-PE-35544	L41320	1997	GOI	Solar Homes Systems	20.00		20.00	0.00
<b>TOTAL</b>					<b>8342.40</b>	<b>0.00</b>	<b>5034.69</b>	<b>8411.96</b>
<b>Active Loans</b>								
					<b>3040.45</b>	<b>14574.31</b>		<b>17614.76</b>
<b>Total disbursed (IBRD and IDA)</b>								
Of which repaid					60.57	6462.37		6522.94
Total now held by IBRD and IDA					<b>8016.58</b>	<b>8144.89</b>		<b>16161.47</b>
<b>Amount sold</b>					<b>0.00</b>	<b>88.08</b>		<b>88.08</b>
Of which repaid					0.00	82.35		82.35
<b>Total undischursed</b>					<b>5034.69</b>	<b>32.94</b>		<b>5067.63</b>

a. Intended disbursements to date minus actual disbursements to date as projected at appraisal.

Note:  
 Disbursement data are updated at the end of the first week of the month.



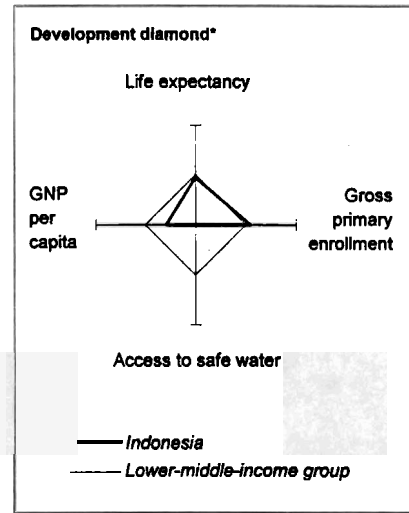


## Indonesia at a glance

2/20/97

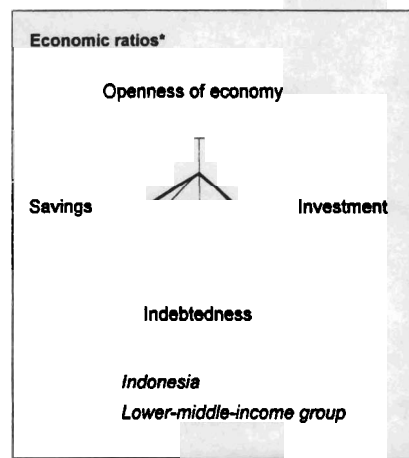
## POVERTY and SOCIAL

	Indonesia	East Asia	Lower-middle-income
Population mid-1995 (millions)	193.3	1706	1153
GNP per capita 1995 (US\$)	980	800	1670
GNP 1995 (billions US\$)	190.1	1365	1926
<b>Average annual growth, 1990-95</b>			
Population (%)	1.6	1.3	1.4
Labor force (%)	2.5	1.4	1.7
<b>Most recent estimate (latest year available since 1989)</b>			
Poverty: headcount index (% of population)	17	..	..
Urban population (% of total population)	34	31	56
Life expectancy at birth (years)	64	68	67
Infant mortality (per 1,000 live births)	51	40	41
Child malnutrition (% of children under 5)	39	23	22
Access to safe water (% of population)	63	77	..
Illiteracy (% of population age 15+)	16	17	..
Gross primary enrollment (% of school-age population)	114	117	104
Male	116	120	105
Female	112	116	101



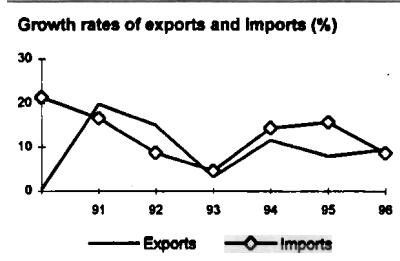
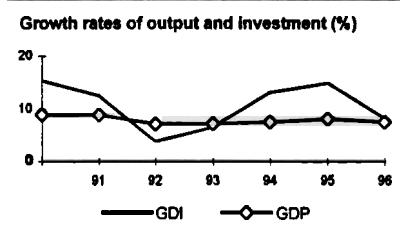
## KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1975	1985	1995	1996
GDP (billions US\$)	32.1	87.2	201.2	232.8
Gross domestic investment/GDP	23.7	26.1	31.5	31.6
Exports of goods and non-factor services/GDP	23.2	22.2	26.0	25.8
Gross domestic savings/GDP	25.9	27.8	32.3	32.3
Gross national savings/GDP	23.4	22.8	28.2	28.2
Current account balance/GDP	-3.4	-2.2	-2.6	-3.3
Interest payments/GDP	1.0	2.3	2.5	2.2
Total debt/GDP	35.8	42.1	53.6	44.2
Total debt service/exports	15.1	28.8	29.9	30.0
Present value of debt/GDP	..	..	51.3	..
Present value of debt/exports	..	..	187.7	..
<b>(average annual growth)</b>				
	1975-85	1986-96	1995	1996
GDP	7.0	7.9	8.2	7.6
GNP per capita	4.3	6.2	5.8	6.0
Exports of goods and nfs	-1.0	9.3	8.0	9.6



## STRUCTURE of the ECONOMY

	1975	1985	1995	1996
<b>(% of GDP)</b>				
Agriculture	30.2	23.2	16.9	15.5
Industry	33.5	35.9	40.9	39.9
Manufacturing	9.8	16.0	23.9	23.3
Services	36.3	40.9	42.2	44.6
Private consumption	65.1	60.4	59.6	60.7
General government consumption	9.0	11.8	8.1	7.0
Imports of goods and non-factor services	21.0	20.5	25.2	25.2
<b>(average annual growth)</b>				
	1975-85	1986-96	1995	1996
Agriculture	4.2	3.4	4.0	3.0
Industry	7.0	9.9	10.3	9.4
Manufacturing	14.5	11.2	11.1	9.9
Services	9.0	8.1	7.9	7.6
Private consumption	9.8	6.9	8.7	7.3
General government consumption	10.5	4.8	3.4	3.5
Gross domestic investment	12.1	10.7	15.0	8.3
Imports of goods and non-factor services	8.8	9.4	15.8	8.7
Gross national product	6.5	7.9	7.4	7.5



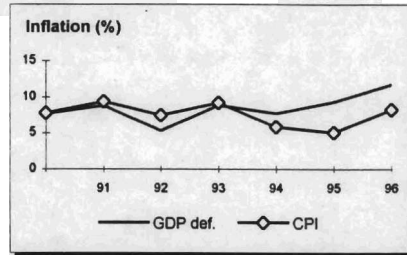
Note: 1996 data are preliminary estimates. Figures in italics are for years other than those specified.

\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

## Indonesia

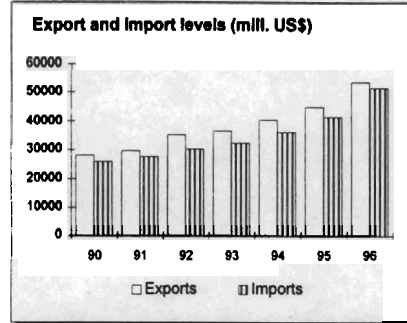
## PRICES and GOVERNMENT FINANCE

	1975	1985	1995	1996
<b>Domestic prices</b>				
<i>(% change)</i>				
Consumer prices	19.1	4.7	5.1	8.3
Implicit GDP deflator	11.2	4.3	9.4	11.8
<b>Government finance</b>				
<i>(% of GDP)</i>				
Current revenue	..	19.2	15.5	15.0
Current budget balance	..	6.0	6.4	6.4
Overall surplus/deficit	..	-3.2	-0.2	0.7



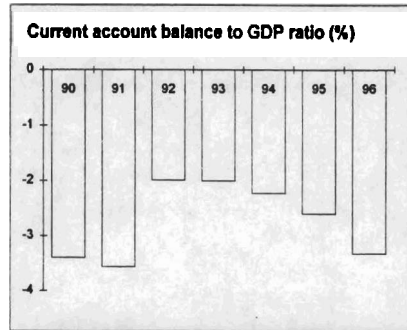
## TRADE

	1975	1985	1995	1996
<i>(millions US\$)</i>				
Total exports (fob)	..	18823	44792	53286
Fuel	..	12804	8638	11771
Rubber	..	714	1554	2589
Manufactures	..	2287	23487	32964
Total imports (cif)	..	14056	41286	51347
Food	..	812	868	997
Fuel and energy	..	2870	3841	4333
Capital goods	..	5394	16712	21114
Export price index (1987=100)	..	121	137	..
Import price index (1987=100)	..	85	127	..
Terms of trade (1987=100)	..	143	108	..



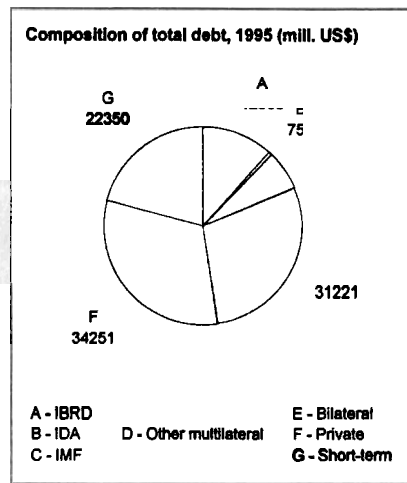
## BALANCE of PAYMENTS

	1975	1985	1995	1996
<i>(millions US\$)</i>				
Exports of goods and non-factor services	6981	19371	51812	59474
Imports of goods and non-factor services	6775	17840	50086	57967
Resource balance	207	1531	1726	1506
Net factor income	-1342	-3542	-7457	-8935
Net current transfers	27	88	487	-337
Current account balance, before official transfers	-1108	-1923	-5244	-7766
Financing items (net)	257	962	6621	12733
Changes in net reserves	851	961	-1377	-4968
<b>Memo:</b>				
Reserves including gold (mill. US\$)	592	13184	26139	27519
Conversion rate (local/US\$)	415.0	1110.6	2248.6	2337.5



## EXTERNAL DEBT and RESOURCE FLOWS

	1975	1985	1994	1995
<i>(millions US\$)</i>				
Total debt outstanding and disbursed	11498	36715	96543	107831
IBRD	57	3590	12008	12503
IDA	318	844	776	756
Total debt service	1060	5823	14272	16419
IBRD	2	384	2156	1875
IDA	2	12	26	26
<b>Composition of net resource flows</b>				
Official grants	69	136	218	249
Official creditors	515	980	1615	1101
Private creditors	1749	154	1967	2428
Foreign direct investment	476	310	2109	4500
Portfolio equity	0	0	3672	4873
<b>World Bank program</b>				
Commitments	311	1068	1538	1312
Disbursements	164	777	1184	1044
Principal repayments	0	133	1259	975
Net flows	164	644	-76	69
Interest payments	3	262	922	926
Net transfers	160	382	-998	-857



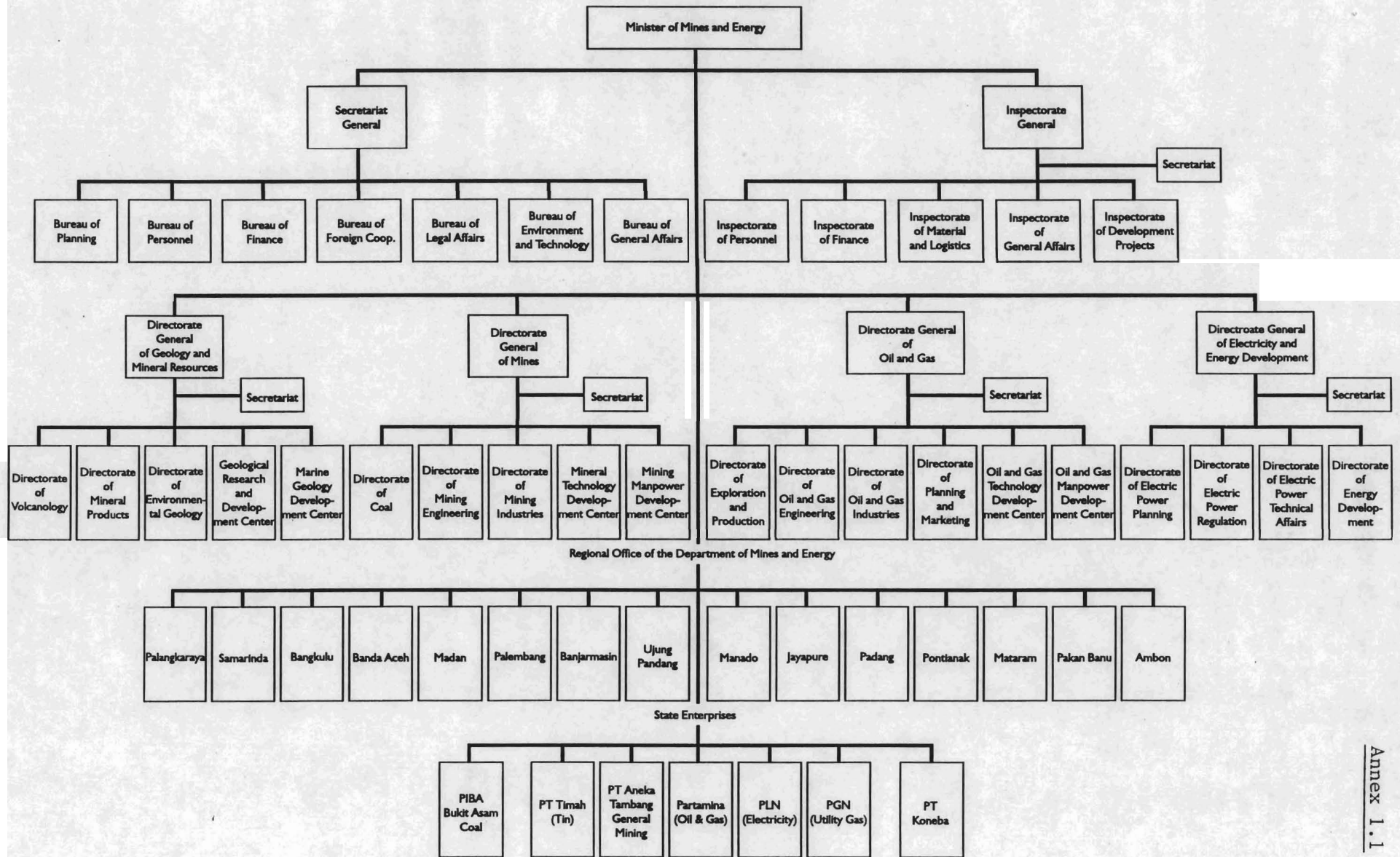
## **PART II: Technical Annexes**

**LIST OF ANNEXES**

- 1.1 MME Organizational Chart
- 2.1 PLN's Marginal Costs
- 2.2 Power Subsector-List of IDA Credits and Bank Loans
- 2.3 PLN's Published Power Purchase Tariff
- 3.1 Performance Indicators
- 3.2 Pipeline of Participants
- 3.3 Bank Indonesia's Bank Rating System
- 3.4 Incremental Costs and Global Environmental Benefits
- 3.5 Information in Subborrower's Business Plan
- 3.6 Estimated Disbursement Schedule
- 3.7 Project Implementation Schedule
- 3.8 Procurement Plan
- 3.9 Supervision Activities and Schedule
- 3.10 Environmental Compliance - Report for Biomass Projects
- 3.11 Guidelines For Environmental Review of Mini-Hydro Projects
- 3.12 Draft Policy for Land Acquisition and Resettlement for the Small-Scale Power Generation Projects
- 3.13 Resettlement Action Plan (RAP) Outline of Contents
- 4.1 Internal Economic Rate of Return
- 5.1 Selected Documents in Project File

**MAP: IBRD 25506R**

**INDONESIA**  
**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**  
**Organization Chart of the Ministry of Mines and Energy**



## INDONESIA

## RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT

## Marginal Cost of Conventional Electricity Supply (US¢/kWh)

Region/Grid	System-wide Average Cost of Supply	Marginal Costs of Generation at MV
<b>Outside Java - Bali</b>		
• Regional grid	11.8	8.0
• Diesel operation	15-20+	14-22+
<b>Java-Bali</b>	8.5	6.5

Source: PLN

## INDONESIA

## RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT

## Power Subsector - List of IDA Credits and Bank Loans

<i>Bank FY</i>	<i>Credit or Loan No.</i>	<i>Date Closed/Closing</i>	<i>Project Title</i>	<i>Amount \$ Million</i>	<i>PPAR/PCR/ICR. Report No. Date</i>	
70	Credit 165	1975	Jakarta Power Distribution	15.81	2741	Nov 1979
72	Credit 334	1978	Jakarta Power Distribution II	40.00	2741	Nov 1979
73	Credit 399	1980	Thermal Power	46.00	5104	May 1984
75	Loan 1127	1980	Power IV	41.00	5104	May 1984
76	Loan 1259	1981	Power V	90.00	5300	Oct 1984
77	Loan 1365	1984	Power VI	116.00	6238	Jun 1986
78	Loan 1513	1985	Power VII	78.40	6762	Apr 1987
79	Loan 1708	1986	Power VIII	158.10	7902	Jun 1989
80	Loan 1872	1987	Power IX	224.80	7902	Jun 1989
81	Loan 1950	1987	Power X	250.00	7902	Jun 1989
82	Loan 2056	1988	Power XI	167.00	8701	Jun 1990
83	Loan 2214	1991	Power XII	278.63	11014	Sep 1992
83	Loan 2300	1990	Power XIII (Cirata)	270.32	11014	Sep 1992
84	Loan 2443	1991	Power XIV	205.11	11014	Sep 1992
85	Loan 1950-1	1990	Power X Supplemental	49.20	7902	Jun 1989
87	Loan 2778	1992	Power Transmission & Distribution	222.81	14725	Jun 1995
	Loan 3097	1995	Power Sector Efficiency	337.00	15876	June 1996
89	Loan 3098	1995	Paiton Thermal Power	354.00	15762	June 1996
89	Loan 3180	1995	Rural Electrification	329.00	15210	Dec 1995
90	Loan 3349	1996 <sup>/a</sup>	Power Transmission	275.00	-	-
91	Loan 3501	1999 <sup>/a</sup>	Suralaya Thermal Power	423.60	-	-
92	Loan 3602	1999 <sup>/a</sup>	Cirata Hydroelectric Phase II	104.00	-	-
93	Loan 3761	2000 <sup>/a</sup>	Sumatera-Kalimantan	260.50	-	-
94	Loan 3845	1998 <sup>/a</sup>	Second Rural Electrification	398.00	-	-
96	Loan 3978	2000 <sup>/a</sup>	Second Power Transmission & Distribution	373.00	-	-
97	Loan xxxx	2001 <sup>/b</sup>	Solar Home Systems	20.00	-	-
			<b>Total</b>	<b><u>5127.28</u></b>		

/a Ongoing project

/b Loan not yet effective



**INDONESIA**

**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**

**PLN'S PUBLISHED POWER PURCHASE TARIFF FOR SMALL RENEWABLE POWER PROJECTS  
(Rp/kWh delivered at medium voltage (20 kV))**

Region and Interconnected System	Firm Capacity				Non Firm Capacity	
	Capacity Payment		Energy Payment		Energy Payment	
	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
Java-Bali System	154.00	12.50	118.00	86.00	118.00	86.00
<u>Zone 2</u> Region II, Medan System	181.50	14.00	153.00	87.50	153.00	87.50
<u>Zone 3</u> Region III, Padang System Region IV, Palembang System Region VI, Barito System Region VII, Ujung Pandang System	195.50	15.00	185.50	136.50	185.50	136.50
<u>Zone 4</u> Region V, Pontianak System Region VII, Manado System	185.00	14.00	124.00	119.50	124.00	119.50
<u>Zone 5</u> Isolated Diesel Systems	246.00	21.50	131.50	126.50	131.50	126.50

## INDONESIA

## RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT

## Performance Indicators

This annex consists of two tables. Table 1 provides the key performance indicators to be used to monitor the progress of the project, while Table 2 provides additional information about inputs, outcomes, risks and impact.

For the purposes of measuring the Project's performance, the national and global objectives (paras 3.2, 3.3 ) are expressed more concisely as:

- **Objective A:** Facilitate private sector led development of small renewable power projects selling electricity to a PLN grid on a commercially sustainable basis.
- **Objective B:** Lower resource information barriers that block private sector investment in small renewable power projects.

**Approximate nature of targets** Some of the value of the indicators in Table 1 have been derived on the basis of the best possible estimates of the outcomes that depend either upon the future behavior of private sector entrepreneurs who have yet to become fully established in this business or upon resource information that is not yet available. For this reason, these targets have been stated as approximate values rather than as precise numbers.

**Relative weights for evaluation purposes** The bulk of the resources under this Project will be devoted to the primarily for Objective A (Table 2). While Objective B is important from the projection of longer term market development, it is secondary in that the best stimulus for market development is from the example set by actual projects on the ground (i.e., the outcome of Objective A).

- For **Objective A**, a “satisfactory” rating would require that, as of the ICR year, (i) the actual numerical values are within 80% of the targets, and delays in plan preparation not exceed nine months, and (ii) a “highly satisfactory” rating would require that the actual values are within 90% of the targets, and delays in plan preparation not exceed six months.
- For **Objective B**, A “satisfactory” rating would require that the actual values of the indicators are within 80% of the targets, and a “highly satisfactory” rating would require that the indicators be within 90% of the targets.
- The **Overall** rating for the project would be largely determined by the rating for Objective A. The project outcome would be rated “satisfactory” if both objectives are rated “satisfactory”. For the project to be rated “highly satisfactory”, Objective A would have to be rated as such, with a “satisfactory” or better rating” on Objective B. By the same token for the project to be rated unsatisfactory, Objective A would have to be rated “unsatisfactory”.

**INDONESIA**  
**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**  
**Table 1: Key Performance Indicators\***

Project Objectives	Performance Indicators	Baseline Year 1996	Mid-Term Year 1999	ICR Year 2001	Full Impact Year 2005
A. Facilitate private sector led development of small renewable power projects selling electricity to a PLN grid on a commercially sustainable basis	<b>Outcome Indicators</b>				
	- Number of private sector renewable energy small power projects connected to PLN grids	0	3	10-12	15-20
	- Total capacity of private sector renewable energy small power projects connected to PLN grids (MW)	0	23	80-90	100-140
	- Availability of basic resource information for potential projects		15 projects	30-40 projects	50-60 projects
	- Number of developers with a bad debt-service record**	-		0-1	
	<b>Impact Indicators</b>				
	- Cumulative diesel use displaced (million liters/year)	-	40	140	200
- Net Present Value Foreign exchange saved over 20 years (US\$ million)	-	25	90	125	
- Cumulative environmental benefits ('000 tons CO2 emissions abated)	-	1,500	6,290	9,950	
B. Lower resource information barriers that block private sector investment in small renewable power projects.	<b>Outcome Indicator</b>				
	- Basic resource information available		Plan prepared	About 35 - 50 projects	About 100 projects
	<b>Impact Indicator</b>				
- Improved prospects for accelerated development of renewable energy potential outside Java (MW)				About 75	About 200

\*To be finalized during negotiations.

\*\* Definition of bad debt-service record (i.e. sub-loan recovery rates) to be agreed to during negotiations.

**Table 2: PERFORMANCE MONITORING : Outcomes, Risks and Impacts**

Objectives	Inputs	Output	Outcomes	Targets	Risks	Impacts
<b>A. Facilitate private sector led development of small renewable power projects selling electricity to a PLN grid on a commercially sustainable basis</b>	<ul style="list-style-type: none"> <li>• IBRD loan (\$66m)</li> <li>• GEF grant (\$3m)</li> <li>• Private sector/commercial banks (\$69m)</li> <li>• IBRD, private sector and commercial banks' funds will finance the development of renewable energy small power projects by private developers</li> <li>• GEF funds will assist private developers in pre-investment activities and initial implementation support</li> </ul>	<ul style="list-style-type: none"> <li>• Construction and commissioning by private sector of commercially viable renewable energy small power projects (mainly biomass)</li> </ul>	<ul style="list-style-type: none"> <li>• Recognition by private developers, commercial banks and PLN that private renewable energy projects can benefit all of them</li> <li>• Reduced diesel consumption with associated CO<sub>2</sub> emissions mitigation and foreign exchange saving</li> </ul>	<ul style="list-style-type: none"> <li>• About 12-15 additional renewable energy projects</li> <li>• Reduction in diesel use, mitigation of CO<sub>2</sub> EMISSIONS, foreign exchange savings</li> </ul>	<ul style="list-style-type: none"> <li>• Private sector firms fail to be attracted because of problems in dealing with PLN, or higher than anticipated transaction costs</li> <li>• Private developers fail to repay their loans.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased reliance on indigenous resources, environmentally sustainable and consistent with a least-cost plan</li> <li>• Reduction in costs of PLN's outside Java operations</li> </ul>
<b>B. Lower resource information barriers that block private sector investment in small renewable power projects</b>	<ul style="list-style-type: none"> <li>• GEF grant (\$1m) to develop a system of collection and dissemination of basic renewable energy resource information</li> </ul>	<ul style="list-style-type: none"> <li>• Renewable resource database and information system of collection, updating and dissemination of renewable resource information</li> </ul>	<ul style="list-style-type: none"> <li>• Private sector has easier access to reliable and required information on renewable resource potential for small renewable power projects</li> </ul>	<ul style="list-style-type: none"> <li>• For about 35 - 50 projects resource information is upgraded to a level whereby private sector can conduct a pre-feasibility study.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of commitment leads to poor results.</li> </ul>	<ul style="list-style-type: none"> <li>• Improved prospects for accelerated development of renewable energy potential outside Java.</li> </ul>

## INDONESIA

## RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT

## PROSPECTIVE PARTICIPANT PROJECTS

## 1.1 Prospective Investment Project Pipeline

The pipeline of prospective project participants consists of (i) about 85 MW of bagasse and other biomass cogeneration projects and (ii) 15 MW of mini-hydro projects. Table 1 shows the regional distribution of these projects. The projects are in listed two groups: *Group 1* projects, which have had feasibility studies completed and are expected to reach financial closure shortly after loan effectiveness, and *Group 2* projects, most of which have had pre-feasibility studies completed and financial closure is expected to take place within one year of loan effectiveness.

Table 1: Prospective Small Private Power Projects

Province	Group 1 Projects*		Group 2 Projects*	
	Number	Size (MW)	Number	Size (MW)
<b>Sugar Mills Projects</b>				
Java	2 mills	17	3-4 mills	23
Sulawesi	-	-	1 mill	3
Sumatera	1 mill	6	2-4 mills	29
Kalimantan	-	-	1 mill	4
Total - Sugar mills	3 mills	23	7-10	59
<b>Other Biomass Projects</b>				
Sumatera	-	-	1 project	3
<b>Mini-hydro Projects</b>				
Sumatera			2-4 projects	15
Total SPP Projects	3 projects	23	10-15 projects	77

\* *Group 1* projects have had feasibility studies completed and are expected to reach financial closure shortly after loan effectiveness; most of *Group 2* projects have had pre-feasibility studies completed and financial closure is expected within one year of loan effectiveness.

## 1.2 A Brief Description of Cogeneration of Power in Sugar Mills

Sugar mills process cane stalks to produce sugar. Sugarcane bagasse is the fibrous residue of sugarcane stalks which remain after the juice is removed. Cane sugar mills have traditionally burned their bagasse in conventional steam boilers to produce steam, which can be used directly as steam in the sugar making process or used to generate electricity for the mill's own use.

Historically, once the mill's own needs for steam were satisfied, any surplus bagasse was generally considered a waste product requiring disposal. Consequently, there was no incentive to maximize the efficiency of the energy production from bagasse. There are however, alternatives uses for bagasse such as paper making feed-stock, fiber and pressed board feed-stock, furfural and other chemical feed-stock, and as a fuel for surplus electricity generation for sale to the grid. As a result, increasing attention is being paid to the efficiency of the energy production and use in sugar mills to maximize the bagasse availability for by-

product revenue generation. Already, there are sugar mills in Central America, Hawaii, Florida, Pakistan, Mauritius, and India where substantial amounts of grid supply electricity are profitably produced by the sugar industry.

In Indonesia, the first option for using surplus bagasse to produce power for sale to the grid is to use underutilized boiler capacity. A new condensing turbine generator is installed to allow full utilization of the surplus bagasse during or after the season to produce electricity for sale to the grid. The majority of the projects in Indonesia will fall into this category.

A second option is to install new boilers with higher temperatures and pressures than are currently used by the mills. This results in a technically more efficient use of bagasse, and surplus bagasse can be burned to produce more steam that can be utilized in new condensing or condensing/extraction steam turbine generators in lieu of or as a supplement to existing back pressure units. As before, excess electricity would be fed to a PLN grid.

A sector environmental assessment (SEA) report for the sugar industry was performed during project preparation and is available in the project files.

### **1.3 A Brief Description of Participating Sugar Mills**

There are 70 sugar mills in Indonesia producing over 2 million tons per year of sugar. The domestic demand is greater than the industry can supply and at least 8 large new sugar mills (10,000 tpd cane processing each) are in the planning stages for erection on Sumatera and Sulawesi, while a large number of existing mills are also being expanded to the 5,000 - 7,000 tpd size range. Sugar mills in Indonesia process from about 2,000 tpd to 12,000 tpd sugar cane for an average 180 day season (150 - 210 days).

Of the 70 mills, 58 are public sector mills while 12 are privately owned and operated. Over 50 of the mills are currently located on Java. About 20 of the public sector mills on Java (the smallest and least efficient) are to be closed over the next several years because of land use conflicts and poor financial returns. The ages of the mills varies from almost 100 years to less than 5 years. The Government policy now encourages the sugar industry growth outside Java and to be heavily private sector reliant. The public sector mills that will continue to operate are the ones running most efficiently and profitably now. The public sector mills operate under State Corporations that are structured as semi-autonomous profit centers that are held accountable for financial performance. RESPP projects are planned in those public and private sector mills that can provide credit worthy balance sheets.

The RESPP pipeline projects tend to be in sugar mills that are at least 10 years in operation, because the newer and larger mills tend to be too far from appropriate grid interconnect (more than 40 km) and/or are in regions with too low a local kW demand. RESPP does project projects in the newer (and generally larger) mills as the inevitable follow-on to the RESPP project as PLN grid extensions progress and off-Java population centers continue to grow.

RESPP is also only working with sugar mills that can project viable sugar making operations in the long term (10 - 15 years). The sugar mills tend to be clustered, especially on Java and parts of Sumatera, with the clustered mills normally owned by the same company. The projects identified in the pipeline will normally be year round (firm power) grid-supply projects where the supplementary fuel will be surplus bagasse produced by the project mill, plus surplus bagasse transported from adjacent mills. In

some cases, this supplementary fuel supply would be transported from a nearby location (normally less than 30 km).

The RESPP projects are strategically planned such that mills with existing surplus equipment, with expansion plans, or with boiler or steam turbine-generator replacement requirements are priority project sites. This approach allows low investment and/or dual cost recovery to be accounted against some procurements, and tends to assure the reliability that produces 90+% availability factors in the plants. This approach was developed in conjunction with the Ministry of Agriculture, Indonesia Sugar Council, and has allowed RESPP to produce a pipeline of potential projects with high probability of excellent reliability and good financial returns. As PLN considers the load flow implications of all projects before approval and issuance of the PPA, the sugar industry grid supply projects can be characterized as being an integral part of a sound power sector development strategy.

**INDONESIA****RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT****Bank Indonesia's Bank Rating System**

The criteria used by Bank Indonesia (BI) to assess the financial soundness of banks is based on an evaluation of five factors -- capital adequacy, asset quality, earnings, liquidity and management -- considered crucial to the soundness of a financial institution. Ratios, calculated from data provided in monthly reports submitted by banks, are compared to the norms see below established by BI for each of the five areas of evaluation. An overall rating is then computed and banks informed of their rating by BI as appropriate.

The soundness of a bank is determined on the basis of a reward system for each of the above five areas of evaluation. In order to compute the total reward points, the following rule is applied:

**Capital (25 percent):** capital adequacy based on a risk-weighted assets as defined under the BIS guidelines for the G-10 countries. All financial institutions are required to reach a minimum 5 percent capital ratio by March 1992, increasing to 7 percent by March 1993 and 8 percent by December 1993. If a bank is below and/or up to the minimum capital required, there are no (or zero) reward points. With every increase of 0.01 percent over the minimum capital requirement, a bank is awarded one reward point;

**Asset quality (30 percent):** classified assets as a proportion of total earning assets of a bank. If classified assets are 15.5 percent or above of total earning assets, there are no (or zero) reward points. With every decrease of 0.15 percent from the 15.5 percent classified assets to total earning assets ratio, a bank is awarded one reward point;

**Earnings (10 percent):** consists of two factors: return on total assets and the ratio of operational cost to operational income. If return on total assets is zero or negative, there are no (or zero) reward points. With every increase of 0.015 percent in return on total assets, a bank is awarded one reward point. If the ratio of operational cost to operational income is one, there are no (or zero) reward points. With every decrease of 0.08 percent in this ratio, a bank is awarded one reward point;

**Liquidity (10 percent):** ratio of total current liabilities to total current assets. If this ratio is one, there are no (or zero) reward points. With every decrease of 1 percent in this ratio, a bank is awarded one reward point; and

**Management (25 percent):** a qualitative factor, is reviewed from many aspects, including a bank's internal control systems, MIS, capital position, asset quality, liquidity, lending policy, compliance with Bank Indonesia regulations, reporting requirements, etc. Every positive aspect of a bank's management is awarded with four-tenths of a reward point.



The soundness of a bank is rated on the basis of total reward points as follows:

- a. SEHAT (Sound) - if its reward points range from 81 to 100
- b. CUKUP SEHAT (Fairly Sound) - if its reward points range from 66 to 80
- c. KURANG SEHAT (Unsatisfactory) - if its reward points range from 51 to 65
- d. TIDAK SEHAT (Poor) - if its reward points range from 0 to 50.

**INDONESIA****RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT****Incremental Costs and Global Environmental Benefits****Broad Development Goals**

1. Indonesia's basic goals and policies for the development of the energy sector highlight the importance of meeting Indonesia's rapidly growing energy needs in an efficient manner, including through conservation and diversification of primary energy resources, and minimizing the adverse environmental and social impacts of energy use. A key and continuing thrust of the Government's energy strategy is to slow down Indonesia's transition to net oil importer status by diversifying energy supply for domestic consumption towards alternative and economic indigenous resources that have a non-exportable surplus or are non-tradable, such as renewable energy. Rural electrification (RE) is a key and integral part of the Government's rural development strategy.

**Baseline**

2. In Indonesia today, the supply of electricity to rural households depends heavily on diesel-based generation. The national power utility (PLN) owns and operates over 5,000 diesel plants scattered throughout Indonesia -- about 2,000 MW of diesel generating capacity -- as a primary means to supply power for rural electrification. Further, in PLN's present rural electrification plans, the default option is to add diesel-based generation capacity. Further, in Indonesia, at present, there are no private small renewable energy power projects that sell their output to PLN.

3. In these circumstances, the baseline course of action is that PLN will continue to rely on diesel-based generation for rural electrification.

**Global Environmental Objective**

4. The baseline course of action will lead to significant emissions of greenhouse gases (CO<sub>2</sub>). Thus, the global environmental objective of the RESPP project is the mitigation of GHG emissions.

**GEF Alternatives**

5. The renewable energy power projects developed under the RESPP project represent the least-cost option. The private producers clearly have an incentive to minimize their costs, and these will be less than PLN's avoided costs, since the private producers will sell their output to PLN on a tariff based on PLN's avoided costs. From the global environmental perspective, the costs of GHG abatement are low since the private producers need GEF support only in the initial phases of developing their projects, and since they are able to bear part of these initial development costs.

6. The small renewable power projects developed under the RESPP project do not need GEF support. Thus, from the global environmental perspective, the only costs of GHG emission abatement are those related to capacity building and institutional change within PLN to mainstream small renewable energy power projects.

## System Boundary

7. The RESPP project is expected to have programmatic benefits, in addition to the project benefits, by demonstrating the financial viability and least-cost nature of renewable energy small power projects. In other words, the RESPP project will accelerate the penetration of renewable energy small power projects.

## Additional Domestic Benefits

8. There are no additional domestic benefits beyond progress towards least-cost provision of electricity.

## Costs

9. **Small Private Power component** The GEF incremental cost arises from two types of activities: (i) support for the pre-investment activities of the private developers as well as guiding and coordinating the power projects through the preparation/development phase in the first two years of the RESPP project, and (ii) resource assessment and management that would not be undertaken by any private individual developer.

10. **Pre-investment activities** The Indonesian project developers will have to hire engineering and environmental firms for pre-investment activities, as there is no precedent in Indonesia for the implementation of small grid supply renewable energy based projects. It is estimated that the pre-investment costs to the potential developers will be in the range \$ 125,000 to \$250,000, excluding internal staff time contributed by the developers. It is expected that about 15 projects would need support for pre-investment activities, for a total cost in the range of \$2.5 to \$3.0 million.

11. **Support activities** There is also a need for a small Project Support Group (PSG) in Indonesia that will serve as the guide, manager, coordinator, and trainer for moving the renewable energy projects through the preparation/development/implementation process. A lean PSG staffed for the two years with one expatriate expert supported by limited short term expatriate experts is expected to have a budget of about \$1.5 million.

12. The total cost of the pre-investment and support activities is \$4.0 million. The counter-factual expenditure of the private developers is based not on renewable energy development but on the business activities that the developers would have otherwise undertaken; this amount is estimated to be \$1 million. On this basis, the GEF incremental costs are \$3.0 million.

13. **Resource management and assessment** Private developers of small hydro and geothermal resources face an inhibiting factor that impedes the timely evaluation and implementation of viable power projects: lack of information about potential sites. Over the years, PLN has assembled an inventory of hundreds of potential small hydro and geothermal project sites, but the level and quality of the inventory information assembled varies considerably, and it lacks the organizational structure needed for an efficient commercial assessment, integration, and prioritization process that is mandatory, if such inventory is to be disseminated to potential developers in a useful form. Under the RESPP project, the available information will be collected, collated and packaged so that it is usable by potential private developers. This database related to hydro and geothermal resources is expected to lead a significant number of renewable energy small power projects.

14. The estimated cost of this database activity is \$1.0 million. Given that no private developer can undertake this or some similar activity, the GEF incremental cost is also \$1.0 million.

15. Thus, the GEF incremental cost is \$4 million.

### **Global Environmental Benefits**

16. The overall avoided emissions are about 10.0 million tons of CO<sub>2</sub>, with a total GEF grant of \$4.0 million, leading to a GEF unit cost of about \$0.43/ton CO<sub>2</sub>. The estimates of the emissions avoided include both the emissions avoided from investments directly supported ("project effect") by the RESPP project (6.3 million tons of CO<sub>2</sub>) as well as the investments indirectly accelerated ("programmatic effect") (3.7 million tons of CO<sub>2</sub>) as a result of the RESPP project. In other words, the impact of the RESPP project is measured as the difference between the market penetration of the renewable energy technologies with and without the RESPP project.

17. For all of the renewable energy technologies, the estimation of total emissions avoided starts with an estimate of the unit emissions avoided factor. Given the likely location of the generation facilities, it is assumed the renewable energy technologies will substitute for the regional grids and the Java-Bali grid. Based on these substitutions, the avoided emissions are calculated in terms of CO<sub>2</sub> tons/GWh. The estimated value is biomass cogeneration: 650 tons CO<sub>2</sub>/GWh.

18. The unit avoided emissions factors are multiplied by the estimated penetration of the technology to arrive at the total emissions avoided. The estimated penetration is based on the projects directly supported by the GEF grants as well as the accelerated penetration induced by the GEF supported activities.

**Incremental Cost Matrix**

19. The incremental cost matrix is presented below.

		Costs	Domestic Benefits	Global Environmental Benefits
<b>Baseline</b>	<i>T.A.</i>	Private sector \$1 million on pre-investment for non-power projects  No expenditure on resource information management		Barriers to renewable energy small power projects remain in place
	<i>Investment</i>	PLN expenditures with an economic cost of US \$ 113 million or more on diesel generation projects	Benefits from electricity produced from 80-90 MW of diesel capacity	No renewable energy small power projects
<b>Alternative</b>	<i>T.A.</i>	\$4 million by private sector for pre-investment and support for renewable energy small power projects  \$1 million for resource information management		Barriers to renewable energy small power private projects reduced or eliminated: (i) high pre-investment costs, and (ii) lack/high cost of resource information
	<i>Investment</i>	Private sector expenditures with an economic cost of US \$ 113 million on renewable energy small power private projects	Cost reduction in and benefits from electricity produced from 80-90 MW of renewable capacity	10-12 renewable energy small power private projects. Net avoided CO2 emissions of 10.0 million tons. Barriers to renewable energy small power private projects reduced or eliminated: (i) lack of term debt financing, and (ii) poor enabling environment
<b>Increment</b>	<i>T.A.</i>	\$3 million for pre-investment and support for renewable sources  \$1 million for resource information management		Barriers to renewable energy small power private projects reduced or eliminated: (i) high pre-investment costs, and (ii) lack/high cost of resource information
	<i>Investment</i>	No incremental cost		10-12 renewable energy small power private projects. Net avoided CO2 emissions of 10.0 million tons. Barriers to renewable energy small power private projects reduced or eliminated: (i) lack of term debt financing, and (ii) poor enabling environment

**INDONESIA**

**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**

**Information Required in a Subborrower's Project Plan**

The project plan should contain the financial, technical and operational information indicated below.

- I. SUMMARY
- II. BACKGROUND OF THE COMPANY
- III. PROJECT TECHNICAL CHARACTERISTICS
- IV. PROJECT COST AND FINANCING
- V. PROJECT OPERATING AND FINANCIAL ANALYSIS AND PROJECTIONS

**Annex**

**Equipment to be used**

**Procurement practices**

**Plans to comply with environmental regulations, and land acquisition and resettlement impacts.**

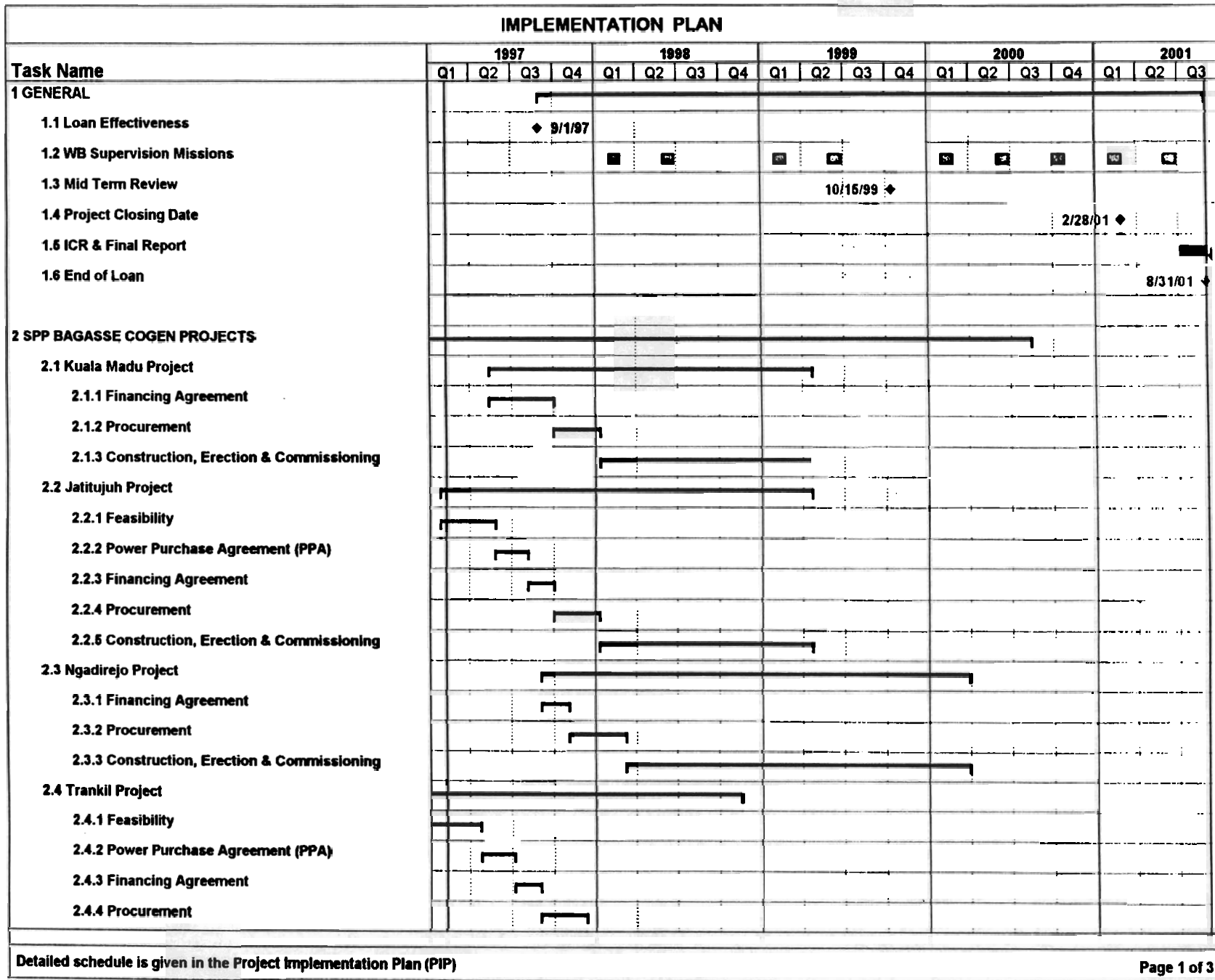
## INDONESIA

## RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT

ESTIMATED DISBURSEMENT SCHEDULE  
(US\$ MILLION)

Bank FY Semester	IBRD CREDIT			GEF GRANT		
	Disbursement Semester	Cumulative Cumulative	Cumulative % of Loan	Disbursement Semester	Cumulative Cumulative	Cumulative % of Grant
1998 - I	0.0	0.0	0%	0.0	0.0	5%
1998 - II	2.0	2.0	3%	0.5	0.5	12%
1999 - I	9.0	11.0	16%	0.5	1.0	25%
1999 - II	9.0	20.0	30%	0.5	1.5	37%
2000 - I	12.5	32.5	49%	0.75	2.2	55%
2000 - II	12.5	45.0	68%	0.75	3.0	75%
2001 - I	7.5	52.5	79%	0.25	3.2	80%
2001 - II	7.5	60.0	90%	0.25	3.5	87%
2002 - I	6.4	66.4	100%	0.5	4.0	100%

**INDONESIA  
RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**



Detailed schedule is given in the Project Implementation Plan (PIP)



### IMPLEMENTATION PLAN

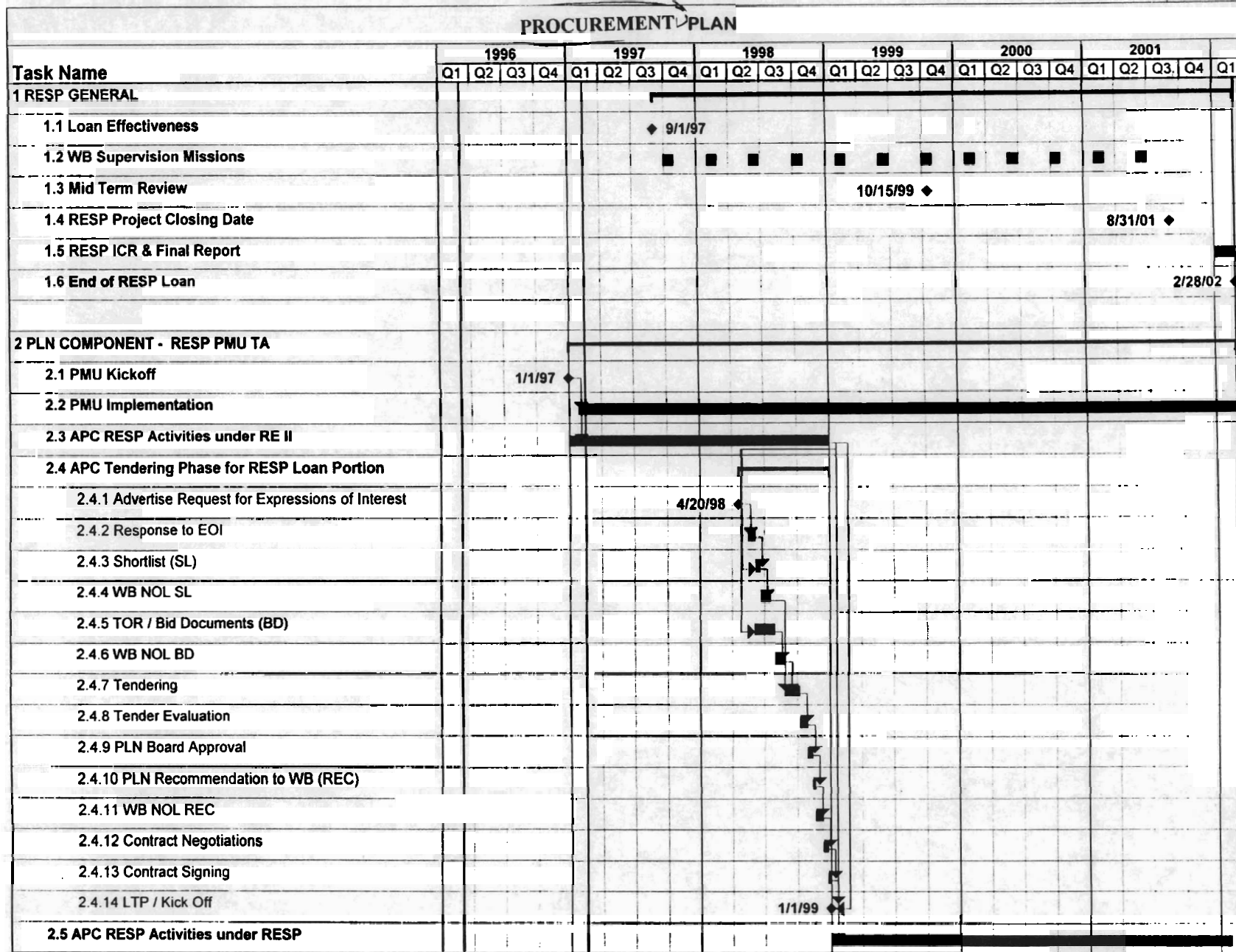
Task Name	1997				1998				1999				2000				2001		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
<b>2.4.5 Construction, Erection &amp; Commissioning</b>				—	—	—	—	—											
<b>2.5 Jatiroto Project</b>		—	—	—	—	—	—	—	—	—	—	—	—	—	—				
2.5.1 Feasibility		—	—																
2.5.2 Power Purchase Agreement (PPA)			—	—															
2.5.3 Financing Agreement				—	—														
2.5.4 Procurement					—	—													
2.5.5 Construction, Erection & Commissioning					—	—	—	—	—	—	—	—	—	—	—				
<b>2.6 Bone/Camring Project</b>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
2.6.1 Feasibility	—	—																	
2.6.2 Power Purchase Agreement (PPA)		—	—																
2.6.3 Financing Agreement				—	—														
2.6.4 Procurement					—	—													
2.6.5 Construction, Erection & Commissioning					—	—	—	—	—	—	—	—	—	—	—				
<b>3 OTHER TURBO-GENERATOR ONLY SPP PROJECTS</b>									—	—	—	—	—	—	—	—	—	—	—
<b>4 OTHER BOILER, TURBO-GENERATOR SPP PROJECTS</b>					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>5 MINI-HYDRO SPP PROJECT (1)</b>				—	—	—	—	—	—	—	—	—	—	—	—				
5.1 Feasibility				—	—														
5.2 Power Purchase Agreement (PPA)					—	—													
5.3 Financing Agreement						—	—												
5.4 Procurement							—	—											
5.5 MH Implementation								—	—	—	—	—	—	—	—				
<b>6 MINI-HYDRO SPP PROJECT (2)</b>				—	—	—	—	—	—	—	—	—	—	—	—				
6.1 Feasibility				—	—														
6.2 Power Purchase Agreement (PPA)					—	—													

Detailed schedule is given in the Project Implementation Plan (PIP)

### IMPLEMENTATION PLAN

Task Name	1997				1998				1999				2000				2001			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
6.3 Financing Agreement																				
6.4 Procurement																				
6.5 MH Implementation																				
<b>7 MINI-HYDRO SPP PROJECT (3)</b>																				
7.1 Feasibility																				
7.2 Power Purchase Agreement (PPA)																				
7.3 Financing Agreement																				
7.4 Procurement																				
7.5 MH Implementation																				
<b>8 SPP PROJECT SUPPORT SERVICES</b>																				
8.1 Tendering Phase																				
8.2 PSG Operation																				
8.3 Pre-investment Fund Operation by DGEED																				
<b>9 SPP RESOURCE INFORMATION (DGEED)</b>																				
9.1 Tendering Phase																				
9.2 RI TA Phase I Work																				
9.3 RI TA Phase II Work																				

# INDONESIA RENEWABLE ENERGY SMALL POWER PROJECT



Detailed implementation schedule is given in the Project Implementation Plan (PIP)

**PROCUREMENT PLAN**

Task Name	1996				1997				1998				1999				2000				2001			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>3 MINI GEOTHERMAL IMPLEMENTATION (ULUMBU)</b>					[Gantt bar spanning from Q1 1997 to Q4 1999]																			
3.1 Project Key dates					[Gantt bar spanning from Q1 1998 to Q4 1999]																			
3.2 Feasibility Study Review & Establish Dev. Strategy					[Gantt bar spanning from Q1 1997 to Q1 1998]																			
3.3 Geotechnical Investigation					[Gantt bar spanning from Q1 1997 to Q2 1997]																			
3.4 Specifications and Tender Documents					[Gantt bar spanning from Q1 1997 to Q4 1997]																			
3.4.1 Produce Specification for Development Concept					[Gantt bar spanning from Q1 1997 to Q2 1997]																			
3.4.2 Produce Tender Docs for Development Concept					[Gantt bar spanning from Q2 1997 to Q3 1997]																			
3.4.3 Develop Procedure for Assessing Tenders					[Gantt bar spanning from Q3 1997 to Q4 1997]																			
3.5 Tendering Phase					[Gantt bar spanning from Q1 1997 to Q4 1997]																			
3.5.1 Issue ICB Procurement Notice					[Gantt bar spanning from Q1 1997 to Q1 1998]																			
3.5.2 TOR / Bid Documents (BD)					[Gantt bar spanning from Q2 1997 to Q3 1997]																			
3.5.3 WB NOL BD					[Gantt bar spanning from Q3 1997 to Q4 1997]																			
3.5.4 Tendering					[Gantt bar spanning from Q4 1997 to Q1 1998]																			
3.5.5 Tender Evaluation					[Gantt bar spanning from Q1 1998 to Q2 1998]																			
3.5.6 PLN Board Approval					[Gantt bar spanning from Q2 1998 to Q3 1998]																			
3.5.7 PLN Recommendation to WB (REC)					[Gantt bar spanning from Q3 1998 to Q4 1998]																			
3.5.8 WB NOL REC					[Gantt bar spanning from Q4 1998 to Q1 1999]																			
3.5.9 Contract Negotiations					[Gantt bar spanning from Q1 1999 to Q2 1999]																			
3.5.10 Contract Signing					[Gantt bar spanning from Q2 1999 to Q3 1999]																			
3.5.11 Contract Procedures					[Gantt bar spanning from Q3 1999 to Q4 1999]																			
3.5.12 LTP / Kick Off					[Gantt bar spanning from Q4 1999 to Q1 2000]																			
3.6 Design Review					[Gantt bar spanning from Q1 1998 to Q2 1998]																			
3.7 Factory Inspections and Test Witnessing					[Gantt bar spanning from Q2 1998 to Q3 1998]																			
3.8 S'Field / Power Plant Site Preparation					[Gantt bar spanning from Q3 1998 to Q4 1998]																			
3.9 S'Field / Power Plant Manufacture and Delivery					[Gantt bar spanning from Q4 1998 to Q1 2000]																			
3.10 S'Field / Power Plant Construction and Commission					[Gantt bar spanning from Q1 2000 to Q2 2000]																			
3.11 Operational Assistance and Training					[Gantt bar spanning from Q2 2000 to Q3 2000]																			

7/1/97

1/1/98

Detailed implementation schedule is given in the Project Implementation Plan (PIP)

PROCUREMENT PLAN																											
Task Name	1996				1997				1998				1999				2000				2001						
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1		
3.12 Steam Field Monitoring																											
3.13 Environmental / Sociological Monitoring																											
<b>4 W. FLORES DISTRIBUTION NETWORK (PLN Procure.)</b>																											
4.1 RE Materials Tendering & Evaluation																											
4.2 RE Materials Contracts																											
4.3 RE Materials Delivery																											
4.4 RE Construction Tendering & Evaluation																											
4.5 RE Construction Contracts																											
4.6 RE Construction Implementation																											
<b>5 MINI HYDRO IMPLEMENTATION</b>																											
5.1 Preliminary Phase (Ongoing)																											
5.2 MH Standard Approach																											
5.2.1 MH Civil Works (PLN Procure.)																											
5.2.2 MH Electro Mechanical Equipment																											
5.2.2.1 MH EM Tendering & Evaluation																											
5.2.2.2 MH EM Contract(s)																											
5.2.3 MH Implementation																											
5.3 MH EPC Approach																											
5.3.1 MH Contracting																											
5.3.2 MH Implementation																											
5.4 MH BOT Approach																											
5.4.1 MH Contracting																											
5.4.2 MH Implementation																											
<b>6 TA - PLN CAPACITY BUILDING</b>																											
6.1 Tendering Phase																											



**PROCUREMENT PLAN**

Task Name	1996				1997				1998				1999				2000				2001					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	
6.2 Phase I Inception Report & Detailed Workplan																										
6.3 Phase II Implementation																										
<b>7 SPP BAGASSE COGEN PROJECTS</b>																										
7.1 Kuala Madu Project																										
7.1.1 Financing Agreement																										
7.1.2 Procurement																										
7.1.3 Construction, Erection & Commissioning																										
7.2 Jatitujuh Project																										
7.2.1 Feasibility																										
7.2.2 Power Purchase Agreement (PPA)																										
7.2.3 Financing Agreement																										
7.2.4 Procurement																										
7.2.5 Construction, Erection & Commissioning																										
7.3 Ngadirejo Project																										
7.3.1 Financing Agreement																										
7.3.2 Procurement																										
7.3.3 Construction, Erection & Commissioning																										
7.4 Trankil Project																										
7.4.1 Feasibility																										
7.4.2 Power Purchase Agreement (PPA)																										
7.4.3 Financing Agreement																										
7.4.4 Procurement																										
7.4.5 Construction, Erection & Commissioning																										
7.5 Jatiroto Project																										
7.5.1 Feasibility																										
7.5.2 Power Purchase Agreement (PPA)																										
7.5.3 Financing Agreement																										

Detailed implementation schedule is given in the Project Implementation Plan (PIP)

**PROCUREMENT PLAN**

Task Name	1996				1997				1998				1999				2000				2001					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	
7.5.4 Procurement																										
7.5.5 Construction, Erection & Commissioning																										
7.6 Bone/Camming Project																										
7.6.1 Feasibility																										
7.6.2 Power Purchase Agreement (PPA)																										
7.6.3 Financing Agreement																										
7.6.4 Procurement																										
7.6.5 Construction, Erection & Commissioning																										
8 OTHER TURBO-GENERATOR ONLY SPP PROJECTS																										
9 OTHER BOILER, TURBO-GENERATOR SPP PROJECTS																										
10 MINI-HYDRO SPP PROJECT (1)																										
10.1 Feasibility																										
10.2 Power Purchase Agreement (PPA)																										
10.3 Financing Agreement																										
10.4 Procurement																										
10.5 MH Implementation																										
11 MINI-HYDRO SPP PROJECT (2)																										
11.1 Feasibility																										
11.2 Power Purchase Agreement (PPA)																										
11.3 Financing Agreement																										
11.4 Procurement																										
11.5 MH Implementation																										
12 MINI-HYDRO SPP PROJECT (3)																										

Detailed implementation schedule is given in the Project Implementation Plan (PIP)

**PROCUREMENT PLAN**

Task Name	1996				1997				1998				1999				2000				2001					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	
12.1 Feasibility																										
12.2 Power Purchase Agreement (PPA)																										
12.3 Financing Agreement																										
12.4 Procurement																										
12.5 MH Implementation																										
<b>13 SPP PROJECT SUPPORT SERVICES</b>																										
13.1 Tendering Phase																										
13.2 PSG Operation																										
13.3 Pre-investment Fund Operation by DGEED																										
<b>14 SPP RESOURCE INFORMATION (DGEED)</b>																										
14.1 Tendering Phase																										
14.2 RI TA Phase I Work																										
14.3 RI TA Phase II Work																										



**INDONESIA**  
**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**

**Supervision Activities and Schedule \***

Approximate Dates/ Duration	Activity - Major Focus	Skills Needed	Staff Weeks
10/97 2 weeks	Project launch activities; environmental review; resettlement issues; review of potential projects	EC, EN, RES, RE	5
2/98 2 weeks	Review of potential projects; site visits	EC, RE	4
6/98 2 weeks	Environmental review, resettlement issues; review of potential projects	EC, EN, RES, RE	5
10/98 2 weeks	Review of potential projects, site visits; Review of PLN's PSKSK tariff and power purchase contract implementation	EC	3
2/99 2 weeks	Review progress of all TA components, environment and resettlement issues	EC, RE	3
5/99 3 weeks	Review of all components	EC, RE	3
10/99 2 weeks	Mid-term review; site visits to selected project sites, in-depth assessment of all TA components	EC, RE, EN, RES	3
5/00 2 weeks	Site visits; review of DGEED's plan of renewable resource information	EC, RE	2
10/00 2 weeks	Review of plan for ongoing program of resource information collection and dissemination	EC, RE	2
5/01 2 weeks	Site visits; TA progress review	EC, RE	2
9/01 3 weeks	Implementation Completion Report (ICR) preparation	EC, RE, EN, RES	6
<b>Total</b>			<b>38</b>

In addition, it is anticipated that 8 SW of time for ongoing supervision from RSI (on disbursement and audits) would be required as follows:., FY 98 - 2 SW, FY 99 - 2 SW, FY 00 - 2 SW, and FY 01 - 2 SW

EC - Economist; Enterprise and Market Development Specialist; EN - Environmental Specialist; RES - Resettlement Specialist; RE - Renewable Energy Specialist

\* Assumes loan effectiveness date of September 1, 1997, project completion date of February 28, 2001, and loan closing date of August 31, 2001.

**INDONESIA****RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT****Outline For Environmental Compliance Report For Biomass Projects**

The suggested table of contents to be used for preparing the environmental compliance reports for the sugar mills is given below:

- 1.0 **Plant description**
  - Plant location
  - Process and operation
  - Use of hazardous chemicals
  - Water resources and water balance
- 2.0 **Environmental management**
- 3.0 **Waste management**
- 4.0 **Environmental Compliance**
  - Administrative compliance
  - Hazardous materials and waste oil
  - Waste water discharge
  - Air emission
  - Ambient air quality
  - Monitoring schedule
  - Solid waste disposal
- 5.0 **Summary of environmental achievements and deficiencies**
- 6.0 **Environmental issues of the new power generation unit**
- 7.0 **Recommended mitigation measures**
  - Environmental management
  - Waste water discharge
  - Air emissions
  - Waste management
  - Monitoring
- 8.0 **Budget estimate for environmental mitigation**

**INDONESIA****RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT****GUIDELINES FOR THE ENVIRONMENTAL REVIEW**  
**AS REQUIRED FOR ENVIRONMENTAL ANALYSIS FOR MINI-HYDRO PROJECTS**

These guidelines identify points that would be reviewed in the environmental review (ER) of mini-hydro projects, including related works on civil, mechanical and electrical engineering to provide water diversion dams, powerhouses, water intake structures, water conveyance structures, electrical systems, grid interconnection, etc.

**SCOPE OF WORK FOR ENVIRONMENTAL ANALYSIS****Project Plan**

1. Provides a general project plan and its schedule and provide two maps drawn to scale, one of the general area and one for the project area.

**Climate**

2. Describe climate type, and meteorological data for temperature, rainfall (seasonal), wind (direction, speed, seasonal).

**Geology**

3. Describe land morphology, topography and geologic structure. Is project located in an earthquake zone, if so, provide quantitative data for the frequency and intensity of earthquakes.

**Hydrology**

4. Provide river stream flow rates (monthly maxima and minima from historical records).
5. Provide data area describing water availability in all seasons and if available, give surface and groundwater quality data during all seasons. Indicate surface and groundwater recharge areas, all uses of water (including irrigation, industrial and other uses), sources of water for drinking, bathing, clothes washing.
6. If the water availability for the different uses is impaired by the project, describe the impact and propose mitigation measures to provide this water at the same quality.
7. Describe river flow disruption during the dry season caused by the project. Describe high sedimentation during construction and immediately after construction and measures proposed to mitigate the situation. Describe the impacts on aquatic organisms during construction (with high sedimentation) and after implementation of the project.
8. A minimum flow of 100 liters/second should be maintained in the bypassed river section during normal plant operation.

### **Land and Soil**

9. Describe land stability, adaptability, layout and use, land allotment, protected lands and soil types, structures and texture.
10. Does the project has an impact on the land stability? If so, describe measures to stabilize the land.

### **Flora and Fauna**

11. Describe types of flora and fauna (land and water), and types of protected flora and fauna.
12. Describe impact of projects on wildlife.
13. Are surveys available describing endangered biological species that might be threatened by the proposed mini-hydro power plant (MHPP) ?

### **Health**

14. What are local health facilities and are there surveys of communicable diseases in the local communities that could be affected especially during the construction phase of the project.
15. Will imported labor force be checked on communicable diseases?
16. What will be the impact of the project on water-borne diseases and parasites. Especially for those sections of the rivers that will fall dry during construction periods, or that the project will fully use available river water.

### **Construction**

17. Provide a list of project activities, including construction, land clearing, land excavation, access road construction, transmission line installation, etc..
18. Provide an estimate of the size of the area used for the project activities, including the main structures, road, transmission lines, and penstocks. Indicate what percentage of the area, allocated for the project, will be restored to conditions prevailing prior to commencement of construction activities. Restored land should not be fenced and/or considered the developer's property.
19. List the heavy equipment to be used in the project construction activities.
20. Describe the impact of this equipment on exiting roads and measures to be taken to repair any damage.
21. Describe in a general way the various building materials, mainly construction aggregates, to be used (type, quantity or volume), where these materials are to be found and how collected, their means of being transported to the site and their storage and the final disposal system for any wastes generated.
22. Describe the environmental impacts on the sites where these materials are collected, or quarried.
23. Describe how the MHPP facilities will be operated, including any special environmental management controls.
24. Describe the types of equipment used in operating the generating systems, including giving the plant's capacity rating.
25. Describe fully the environmental impact of the construction activities.

26. Describe the number of construction workers and the education and expertise required, whether or not these workers can be hired locally, where they will reside during construction and their ages and sex.
27. Describe any training that will be given to workers.
28. Describe the number of operating employees and the education and expertise required, and whether some people can be hired locally.
29. Describe any training that will be given to operators.
30. Describe noise intensity around the power house, how much it is over ambient noise levels and what measures will be taken to mitigate a noise problem.
31. Describe any existing activities adjacent or near the project that could have a positive or negative effect on the project.
32. Do project plans provide for an adequate buffer between project (construction and operation) and any conflicting adjacent land uses? What mitigation is planned for such cases (vegetative screening)?

#### **Cultural-socio-economic-aesthetic impacts**

33. Describe population profiles (age, sex, education, religion, income, health), attitude and perception of the community toward development, condition of the socio-culture heritage and other relevant information.
34. Are there surveys for the area's archaeological, aesthetic and cultural resources that might be threatened by the MHPP?
35. Describe cultural impacts (including on local religion, on local archeological treasures and loss of riparian vegetation used for artisan or medicinal purposes).

#### **Note**

It should be noted that not all the impacts mentioned will be present in all the MHPP projects under consideration. If some do not exist the ER should mention this. Some other impacts could also be quite positive.

**GENERAL POLICY  
FOR LAND ACQUISITION, COMPENSATION AND RESETTLEMENT  
CONCERNING  
MEDIUM AND SMALL-SCALE POWER GENERATION PROJECTS  
(DRAFT)**

## **1. GENERAL**

Compensation and resettlement policy follows from the national regulations on land acquisition (Keppres 55/93). The purpose of Keppres 55 and this policy is to ensure that persons whose land, house or other assets, means of livelihood, business, jobs and environment are adversely affected, are adequately compensated and do not experience any decline in their living standards. The principles and objectives of this policy are stated in the following sections.

The project developer will also promote public understanding of the process adopted for acquisition of land and other affected assets through community information campaign, public awareness programs, community level assistance, and the establishment of grievance procedures and local level field monitoring to help address any problem experienced by communities affected by projects.

The Policy framework lays down the principles and objectives, eligibility criteria of Project Affected Persons (PAPs), entitlements, legal and institutional framework, modes of compensation and rehabilitation, peoples participation features and grievance procedures that will guide the compensation, resettlement and rehabilitation of PAPs. This policy will be followed by the sub-project developers concerned with the Renewable Energy Small Power Projects. This policy would also apply to similar small and medium-scale power generation projects.

## **2. DEFINITIONS**

The terms used in this document are defined as follows:

- (a) 'Project Affected Persons (PAPs)', includes any person or persons who, on account of the execution of the project, or any of its component or sub-project or part thereof, would have their:
  - (i) right, title, or interest in any house, land (including residential, agricultural, and under Adat laws) or any other fixed or moveable asset acquired or possessed, in full or in part, permanently or temporarily; or
  - (ii) business, occupation, work, place of residence or habitat adversely affected; or
  - (iii) standard of living adversely affected
  
- (b) 'PA' means Project Affected Family, and consists of all members of a household residing under one roof and operating as a single economic unit, who are adversely affected by the project, or any of its components. For resettlement purposes, project affectees will be dealt with as members of Project Affected Families (PAFs).

- (c) 'RAP' means the detailed Resettlement Action Plan prepared for a project, or its component, or sub-project where the number of PAPs exceeds 200.
- (d) 'Clearance Space' means the space around the conductors formed by the Minimum clearance to the objects as defined by the Regulation of the Minister of Mines and Energy for loss and Damage) where no residence or any physical intrusion are permitted.
- (e) 'Easement Area' are the areas where the project developers may requires temporary passage but no permanent acquisition of land or structure is required.
- (f) 'NJOP (Nilai Jual Obyek Pajak)', is the assessed value of an asset for tax purposes.
- (g) 'Replacement Cost', are the compensation amounts sufficient to replace affected assets (land, building, other fixed assets) based on the local market prices at the time of the acquisition. (See Appendix 9).

### 3. PRINCIPLES AND OBJECTIVES

The principles outlined in the World Bank's Operational Directives 4.30 have been adopted in preparing this Policy Framework. In this regard the following principles and objectives would be applied:

- (a) Acquisition of land and other assets, and resettlement of people will be minimized as much as possible.
- (b) Buffer zones, if required, will be delineated based on land ownership, safety and environmental considerations. All the land in the buffer-zone will be acquired by the project developers.
- (c) All PAPs residing in, working, doing business, or cultivating land, or having rights over resources within the project area as of the date of the baseline surveys are entitled to compensation for their lost assets at replacement cost and for rehabilitation measures sufficient to assist them to improve or at least maintain their pre-project living standards and incomes. Lack of legal rights to the assets lost will not bar the PAP from entitlement to such compensation and rehabilitation measures.
- (d) Families losing all of their productive assets (farmland, house or business), or in case when the remaining assets are not economically viable, will be entitled for full compensation for the entire affected assets at replacement cost and to rehabilitation assistance that allows them to enhance or at least maintain their standard of living.
- (e) The compensation and rehabilitation measures to be provided are: (i) compensation for easement, temporary acquisition and for assets acquired for clearance space at replacement cost; (ii) compensation at replacement cost for houses, other structures and fixed assets; (iii) a replacement land of equal size and of equal residential quality, agricultural productivity and business potential, as the case may be, at location acceptable to the PAP, or in case suitable replacement land is not available or at request of the PAPs, cash compensation at current market value; (iv) cash compensation to affected businesses,

means of livelihood and incomes; (v) rent allowance and assistance in finding alternate rental accommodation to tenant PAP; (vi) transport allowance and dislocation assistance during transition; and (vii) rehabilitation measures and income restoration programs such as vocational training, credit facilities, job opportunities and other assistance for self-employment as determined suitable for affected PAPs.

(f) Replacement agricultural land, premise/business plot will be as close as possible to the land that was lost and/or acceptable to the PAPs. All replacement land for agriculture, residential and businesses will be provided with secured tenure status and without any additional cost, taxes, surcharge to the PAPs at the time of transfer.

(g) The resettlement transition period will be minimized and compensation, and resettlement where applicable, and other assistance will be provided to the PAPs no later than one month prior to the expected start-up date of works in the respective Project site.

(h) Plans for acquisition of land and other assets and provision of rehabilitation measures will be carried out in consultation with the PAPs.

(i) The previous level of community services and resources will be maintained or improved after resettlement.

(j) Financial and physical resources for resettlement and rehabilitation will be made available as and when required.

(k) Resettlement programs will include adequate institutional arrangements to ensure effective and timely design, planning, consultation and implementation of compensation, resettlement and rehabilitation measures.

(l) Adequate arrangements will be made for effective and timely supervision, internal and external monitoring and evaluation of the implementation of the resettlement and rehabilitation measures.

(m) Acquisition of assets, compensation, resettlement and rehabilitation activities for a segment/section or phase (except where long-term rehabilitation measures such as vocational training recommended) will be completed at least one month prior to the initiation of construction work under the respective segment/section or phase thereof.

#### **4. REPORTING AND DOCUMENTATION**

Based on the Land Acquisition Assessment and information collected at the pre-feasibility or environmental screening stage, on the scale and degree of impact of the project, its component or sub-project, in terms of extent of land acquisition and other assets required and the number of persons affected, marginally or severely, a decision will be taken on the subsequent requirements for surveys, data collection and report preparation.

##### **4.1 Land Acquisition and Compensation Plan**



1. In case the impact of the project is marginal to severe such that less than 200 persons (about 40-50 families) are affected by the project, a Land Acquisition and Compensation Plan (LAP) for each project, sub-project, or component will be prepared and submitted to the Bank for review.

2. In case the impact of the project is only marginal i.e. only part assets (farmland, residential land, house/structure) are affected, project does not result in any displacement of affected families, and the remaining assets are viable for continued use without any adverse impact on the living standards or incomes of affected families, the Land Acquisition and Compensation Plan (LAP) will include : (a) the basic socio-economic data and inventory of affected assets; (b) compensation entitlements; (c) procedures used to assess compensation; and (d) a time-bound action plan for implementation.

3. However, if the project results in displacement of some families the Land Acquisition and Compensation Plan (LAP) will additionally include; (a) rehabilitation entitlements, if necessary; (b) location and area of the replacement agricultural, residential and/or business land to be provided, if that be the case; (c) a detailed budget and source of funding for various compensation and rehabilitation measures; and (d) internal monitoring and evaluation.

4. Compensation, resettlement and rehabilitation activities will only commence after the Bank has found the LAP acceptable.

#### **4.2 Resettlement Action Plans (RAPs)**

1. In case the impact of the project is severe such that more than 200 people (40-50 families) are affected by the Project, its component or sub-project, a Resettlement Action Plan (RAP) for each component or sub-project will be prepared in accordance with the provisions of this Policy Framework. The RAP will be furnished to the Bank for review and approval.

2. Each RAP, in addition to the information to be provided in LAP will include: (a) a detailed socio-economic survey comprising baseline data of PAPs; (b) arrangements for external monitoring and evaluation by an independent agency; (c) grievance redressal mechanisms; and (d) detailed information on the site/s for replacement, including socio-economic information about the host community, if applicable.

3. Compensation, resettlement and rehabilitation activities will only commence after the Bank has found the respective RAP acceptable.

### **5. INSTITUTIONAL AND LEGAL FRAMEWORK**

#### **5.1 Institutional Framework**

The responsibility for implementing the Policy Framework, LAP and RAPs are as follows:

- (a) The overall responsibility for enforcement of the Policy Framework and for planning and implementing the Land Acquisition and Compensation Plan and RAPs rests with the project developers. Project developers will remain ultimately responsible for ensuring that people affected by a project, its component or a sub-project receive compensation as defined in this policy. To ensure that this policy is carried out effectively,

each project will appoint a 'Resettlement Officer' reporting to the Project Officer (pimpro). Resettlement Officer will ensure that all required activities are carried out promptly. Resettlement Officer will receive all necessary logistical and staff support. Pimpro will make special efforts to ensure good community relationship and to promptly resolve compensation problems and complaints. the resettlement officer and Pimpro will ensure the active and affective participation of the PAPs in the preparation and implementation of LAP and RAPs.

(b) Funds for implementing the LAP and RAPs will be provided by the project developers based on budgetary requirements established in the Land Acquisition and Compensation Plan and RAPs.

## **5.2 Legal Framework**

All land acquisition in Indonesia is regulated by Presidential Decree (Keppres) 55/93 concerning Land Acquisition for the Development of Public Interest. Additional relevant laws, policies and regulations include the following:

- a. State Act No. 5 - 1960 concerning Basic Principles on Agraria
- b. State Act No. 5 - 1974 concerning Basic Principles on Administration in The Region and Elucidation
- c. State Minister / Chief of The National Land Use Agency No. 1 - 1994
- d. Government Regulation No. 5 - 1993 concerning Environmental Impact Assessment.
- e. Ministry of Mines and Energy Regulation 01.P/47/M.PE/1992 concerning "Clearance Space of High Voltage Overhead Transmission Lines and Extra High Voltage Overhead Transmission Lines for the Supply of Electric Power".
- f. WHO Recommendations IRPS 1990/INIRC Guidelines of Limits of Exposure to 50/60 Hz Electric and Magnetic Fields (EMF).

## **6. ENTITLEMENT POLICY**

1. Entitlements for compensation and rehabilitation assistance to different categories of PAFs is described in the following sub-sections and presented in a compensation matrix in Table 6.1 of this section:

### **A. PAPs losing Agricultural Land**

(a) The general mechanism for compensation of lost agricultural land will be through provision of "land for land" arrangements of equal size, equivalent productivity and at location acceptable to the PAP where significantly large or entire land holding is affected by the project. In case suitable land is not available, cash compensation at current market value will be provided. However, when the portion of the land to be lost represents 25% or

less of the total area of the land-holding, cash compensation at full replacement value, will be provided to the PAP. In cases where only partial land is affected but the remaining land becomes economically unviable, the PAP will be entitled to surrender the entire holding and to compensation for entire holding at full replacement value, or land-for-land option.

(b) The replacement agricultural land will be provided to the PAP free of any tax, transfer costs, registration fee or charges.

(c) PAPs whose land is temporarily taken by the works under the Project will be compensated at replacement cost for their net loss of income, damaged assets, crops and trees, as the case may be.

(d) Affected tenants on the agricultural land will be compensated for the market value of the gross harvest for one year's production or the remaining period of the tenancy agreement/lease, whichever is greater.

(e) Affected agriculture labor will be compensated for the loss of income and will be paid compensation equivalent to the six months salary and assisted in getting alternative employment.

#### **B. PAPs losing Residential or Commercial Land**

(a) The general mechanism for compensation of lost residential land will be through provision of "land for land" arrangements of equal size and at location acceptable to the PAP where significantly large or entire land-holding is affected by the project. In case, suitable land is not available, cash compensation at current market value will be provided. Where the portion of the land to be lost represents 25% or less of the total area of the land holding, cash compensation at full replacement value for only the affected portion of the holding will be provided to the PAP. However, where only partial land is affected but the remaining land becomes either unviable or in area less than the minimum required under the prevailing zoning laws, the PAP will be entitled to surrender the entire holding and to compensation for entire holding at full replacement value, or land-for-land option.

(b) The replacement land for resettlement will be provided in fixed plot sizes according to the prevailing zoning laws and planning practices. However, if the lost land of PAP is in size larger than the plot sizes for relocation, a cash compensation to cover the difference of the area will be given to the PAP.

(c) The replacement land will be provided to the PAP free of any tax, transfer costs, registration fee or charges at the time of transfer.

(d) PAPs whose land is temporarily taken by the works under the Project, will be compensated at replacement cost for their net loss of income and damaged assets, as the case may be.

#### **C. PAPs losing Houses/Structures**

(a) The mechanism for compensating loss of residential and other structures will be cash compensation reflecting full replacement cost of the structures, without depreciation.

(b) If the house or structure is only partially being affected by the Project, the PAP will be entitled to cash compensation for the affected portion of the structure and assistance in the restoration of the remaining structure for its continued use. However, if the remaining structure is rendered unviable or in area less than the minimum house size under the prevailing zoning laws, the PAP will be entitled to surrender the entire structure and for compensation for entire structure at full replacement cost without depreciation.

(c) Tenants, who have leased a house / structures for residential or other purposes and affected by the project, will be provided with a cash grant equivalent to one month's salary or six months rental allowance, and will be assisted in identifying alternative rental accommodation.

#### D. PAPs losing business

(a) The mechanism for compensating loss of business will be: (i) the provision of alternative business site of equal size and location with good accessibility to customers and satisfactory to the PAP, or cash compensation at full replacement value, if suitable replacement land is not available; (ii) cash compensation for lost business structure reflecting full replacement cost of the structures, without depreciation; and (iii) cash compensation for the loss of income during the transition period.

(b) PAPs whose business premises are affected by the project and are required to be relocated either because the entire premises and/or structures are affected or the remaining premises and/or structures are rendered un-useable, if they so desire, will be given alternate business premises of minimum size acceptable under the zoning laws. However, if the existing affected business premises are larger in area than the minimum plot provided at relocation site a cash compensation to cover the difference in the area will be paid to the PAPs.

2. PAPs will also be provided with compensation at full replacement cost, without depreciation for any other fixed assets affected in part or in full by the project, such as water wells, electric and water connections.

3. In cases where community infrastructure such as schools, factories, water resources, roads, sewage system or electrical supply is damaged, project developers will ensure that these would be restored or repaired as the case may be, at no cost to the community.

4. PAPs without any legal title or ownership right to the land they occupy will be compensated for all their lost assets such as house/structure, fixed assets, shop/kiosk at full replacement cost and provided assistance in finding suitable relocation site.

5. PAPs entitled for relocation will be provided transport allowance or full assistance for transportation, and re-establishment of their house or business structures.

6. All PAPs affected by the project will be entitled to the rehabilitation measures including income restoration programs, training to improve skills and other assistance for self-employment. These rehabilitation measures would specifically focus severely affected (displaced) PAPs, vulnerable groups, itinerant workers, small businesses and those either below the poverty line or

those severely affected by the project and are likely to fall below the poverty line. Detailed baseline survey and socio-economic data will identify such vulnerable groups and the scope and need for specific rehabilitation measure will be assessed during the project implementation stage in consultation with the PAPs. At least 30% of such rehabilitation assistance measures will be reserved for women.

7. PAPs affected by easement will be paid easement compensation as negotiated or a minimum equivalent to 10% value of the affected asset.

8. PAPs affected by the clearance space restrictions will be compensated at their replacement cost.

## **7. PEOPLES PARTICIPATION**

1. The PAPs will participate throughout the various stages of the planning and implementation of Land Acquisition and Compensation Plans and RAPs. For these purposes and prior to the preparation of these documents, PAPs will be informed of the provisions of this Policy Framework through an effective public information campaign and public meetings.

2. Where more than 200 persons are affected by the project, each household & PAP will be fully informed by the project developers of their entitlements and rehabilitation choices under the respective RAP. Project developers will print a short 'Public Information Booklet' to include project objectives, likely impacts of the project on the community, compensation entitlement criteria, and grievance redressal mechanism. The booklet will be distributed to all the affected households as part of public participation and information campaign.

**Table 6.1 : Compensation Matrix**

	Type of Loss	Application	Entitled Person	Compensation
1.	Arable land	Less than 25 percent of land holding lost, the remaining land economically viable	Farmer/title holder	Cash compensation for lost land at replacement cost.
		More than 25 percent of land holding lost OR where less than 25% holding lost but the remaining land becomes economically unviable	Farmer/title holder	Land for land or compensation in cash. Compensation by receiving a new parcel of land of equivalent size and crop productivity and free of taxes, registration and transfer cost; at location acceptable to PAP; and with long-term security of tenure. Eligible for rehabilitation assistance. Transfer/shifting allowance.
			Tenant/lease holder	Cash compensation equivalent to the market value of gross harvest for one year or for the remaining period of tenancy agreement, whichever is greater.
			Agricultural labor	Cash compensation equivalent to 6 months salary and assistance in getting alternative employment.
		Temporary acquisition or easement	Title holder	A minimum cash compensation equivalent to 10% value of the affected asset.
2.	Residential land	Less than 25% of land holding lost and remaining land viable for present use	Occupant/title holder	Compensation in cash at market value.
		More than 25% holding affected OR where less than 25% holding affected but the remaining area becomes smaller than minimally accepted under the zoning laws and unviable for continued use	Occupant/title holder	Land for land or cash compensation. Replacement land of minimum plot of acceptable size under the zoning laws or a plot of equivalent size, whichever is larger, in a nearby resettlement area with adequate physical and social infrastructure. When the affected holding is larger than the relocation plot, cash compensation to cover the difference in area. Replacement land to be free from taxes, registration and transfer costs. Eligible for rehabilitation assistance. Transfer/shifting allowance.
		Temporary acquisition	Title holder	Cash compensation for the net loss of income and damaged assets or at 10% of the value of the affected assets.

3.	Commercial land	Plots used for business partially affected, limited loss	Businessman/title holder	Compensation in cash at market value.
		Plots used for business severely affected. Remaining area insufficient for continued use	Businessman/title holder	Cash or land for land. Replacement land of sufficient size for business continuation in market area of resettlement area or at location comparable to previous site. When the affected premises are larger than the relocation plot, cash compensation at market value to cover the difference in area. Transfer/shifting allowance. Eligible for rehabilitation assistance.
4.	Structures	Structures partially affected but the remaining structure viable for continued use.	Owner	Compensation in cash for affected portion of the structure and other fixed assets, and assistance in restoration of the remaining structure.
		Entire structure affected OR where structures partially affected such that the remaining structure is unviable for continued use.	Owner/occupant	Compensation in cash for entire affected structure and other fixed assets (wells, electric and water connections etc.) at replacement cost, without depreciation. Transfer/shifting allowance. Eligible for rehabilitation assistance.
			Tenant	Cash compensation equivalent to one month's salary or six months' rental allowance. Assistance in alternate rental accommodation.
5.	Loss of business/incomes or employment	Temporary or permanent loss of business/ incomes/ employment	Affected PAPs	Cash compensation for the loss of business, incomes & wages during the transition period. Eligible for rehabilitation assistance.
6.	Standing crops	Crops affected by land acquisition or temporary acquisition/easement	Farmer/title holder or tenant/lease holder	Compensation in cash at market value.
7.	Trees	Trees lost	Person occupying the land where trees are located	Compensation in cash calculated on the basis of type, age and productive value of affected trees.

## **8. IMPLEMENTATION ARRANGEMENTS**

### **8.1 Implementation Schedule**

1. A detailed implementation schedule of various activities to be undertaken will be included in each LAP and RAP.
2. Acquisition of affected assets, payment of compensation and furnishing of other rehabilitation entitlements (in cash or in kind), and relocation if that be the case, will be completed at least one month prior to the scheduled start-up date of construction work on the respective project site.

### **8.2 Complaints and Grievances**

1. Complaints and grievances related to any aspect of the LAP and RAPs, including inventory of assets, price of the lost assets, will be handled as follows:
  - (a) As a first stage, PAPs will present their complaints and grievances to the Resettlement Officer. If the PAP is not satisfied with the decision of the Resettlement officer, the PAP may present the case to the Pimpro and then further to the local authorities.
  - (b) If the PAP is not satisfied with the decision of the Pimpro, the case may be submitted for consideration by the local government and higher authorities as stipulated under Keppres 55/93.
2. PAPs will be exempted from all administrative and legal fees incurred in pursuant to the grievance redressal procedures.

### **8.3 Supervision, Monitoring and Evaluation**

1. Implementation of the Land Acquisition and Compensation Plan and RAPs will be regularly supervised and monitored by respective Pimpro. The findings will be recorded in quarterly reports to be furnished to the Bank.
2. Internal monitoring and supervision will:
  - (a) Verify that the baseline information of all PAPs has been carried out and that the valuation of assets lost or damaged, and the provision of compensation, resettlement and other rehabilitation entitlements has been carried out in accordance with the provisions of this Policy Framework and the respective LAP and RAP.
  - (b) Oversee that the LAP and RAPs are implemented as designed and approved.
  - (c) Verify that funds for implementing the LAP and RAPs are provided to the Pimpro in a timely manner and in amounts sufficient for their purposes, and that such funds are used by the Pimpro in accordance with the provisions of the LAP or RAP.



3. An independent agency or agencies will be retained by the project developers to carry out external monitoring and evaluation of the implementation of RAPs. The independent agencies will be NGOs, academic or research institutions or independent consulting firms, all with qualified and experienced staff and terms of reference acceptable to the Bank.

4. In addition to verifying the information furnished in the internal supervision and monitoring reports of Pimpros, the external monitoring agency will visit a sample of 20% of PAFs in each relevant locations on an annual basis to:

(a) Determine whether the procedures for PAPs participation and delivery of compensation and other rehabilitation entitlements has been done in accordance with this Policy Framework and the respective RAP.

(b) Assess if the Policy Framework objective of enhancement or at least restoration of living standards and income levels of PAPs have been met,

(c) Gather qualitative indicators of the social and economic impacts of Project implementation on the PAPs.

(d) Suggest modification in the implementation procedures of the RAPs to achieve the principles and objectives of this Policy Framework.

## 9. COSTS AND BUDGETS

1. Each LAP and RAP will include detailed cost of compensation and other rehabilitation entitlements and relocation of PAPs, if that be the case, with a breakdown by category of PAPs; agricultural, residential and business land; houses, structures and other assets; rehabilitation assistance, transport and other allowances; phases of the project and by financial year. The cost estimates will make adequate provisions for contingencies.

2. Total cost of LAPs and RAPs will be included towards the cost of the project. In case of any overruns due to unforeseen circumstances or delays, additional funds will be allocated as necessary.

## 10. IMPLEMENTATION PROCEDURES

1. The project developers will acquire land (agricultural, residential, commercial), houses or structures that are being affected, partially or entirely, by power station or sub-station; and other fixed assets such as trees and buildings which fall within the 'buffer-zone' at replacement cost as defined in this Policy Framework. Easement fee or compensation for temporary acquisition of land, where necessary, will also be paid at replacement cost.

2. The procedures adopted for land acquisition and compensation will be as follows:

- Guidance and Counseling : The Project Team, in co-operation with the head of village and sub-district, will arrange a special public meeting with the PAPs regarding the

project and to elicit their views and concerns. 'Public Information Booklet' will be distributed to PAFs.

- Public consultation with the PAPs will be conducted and will involve related government agencies. The project developers will provide all necessary information about the project and related matters, including the timing and procedures for compensation assessment and payment.
- The staking out the boundaries for the required land will be carried out.
- Detailed mapping of the existing and affected land-holding will be prepared.
- Following the preparation of maps, complete inventory of affected including land, houses and other structures, trees, crops, fixed assets etc. will be prepared.
- Project developers will prepare a list of compensation for land and other assets based on the principle of replacement cost in accordance with this policy framework. Any transaction cost, as defined in this policy will be provided by the project developers. All records of asset inventory and compensation assessment will be kept and reported, and made available to the affected people.
- The final compensation amount will be negotiated between both parties to reach final agreement so that the compensation will be at replacement cost.
- The final list of affected assets and compensation will be approved and signed by both the parties. Grievances in regard to the compensation and other matters will be resolved following the procedures outlined in this policy.
- The final step will be the payment of compensation directly to the land owners and other affected persons as agreed between the project developers and the PAPs.

**INDONESIA**  
**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**

**Resettlement Action Plan (RAP)**  
**Outline Of Contents**

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**1 INTRODUCTION**

Sub-project Description : Objectives, main components,  
Physical, social and economic characteristics of the sub-project  
Describe the types of impacts of the sub-project: summary description of the extent of acquisition of land and other assets and its expected adverse social impacts  
Indicate measures taken to minimize adverse impacts

**2. SOCIO-ECONOMIC SURVEY AND RESULTS**

Description of Project Affected Families (PAFs) including their spatial distribution  
Socio-Economic characteristics of PAFs: Household size; age-sex structure; employment types & place of work; major and supplementary sources of income, tenure status (land and house/structures) total and affected land and building areas, description of house/structure, construction type, condition etc.; monthly incomes of all household members (from full time and part-time jobs); place of work, location of school, and time taken to from place of work/school, expenditure pattern (rent, food, travel, health, house, etc); amount of rent paid by tenants/lessee, quantity and category of other fixed assets affected by the sub-project.  
Identify any vulnerable groups present in the project area  
Categories and numbers of PAFs by type and degree of impacts  
Prevailing market prices for different types of assets (land, trees, crops etc.) within and in the vicinity of the project areas, NJOP and PU prices for land and structures

**3. COMPENSATION POLICY AND ENTITLEMENT CRITERIA**

Description of objectives of compensation policy  
Existing by-laws, acts etc. upon which RAP is based  
Eligibility policy for PAFs, cut-off date for eligibility  
Indicate the compensation entitlements for each category of PAFs  
Preparation of 'compensation matrix'  
Methods used for assessment of compensation and determining 'replacement cost' of lost assets

**4. RESETTLEMENT PLAN (Applicable only when settlement of displaced families necessary)**

Description of alternative relocation sites and their characteristics and suitability for resettlement of affected families  
Consultation with PAFs in selection of resettlement alternatives and for relocation sites, where applicable

Socio-Economic data of host population, where applicable  
Description of implementation procedures: land acquisition, payment of compensation, physical relocation

**5. REHABILITATION AND INCOME RESTORATION**

Existing skills and employment pattern of PAPs  
Feasibility analysis of income generation programs at the resettlement site(s) or at the existing location during and post-project period  
Training needs of PAPs in the context of the employment opportunities and market demands in the post-project situations  
Access to credit and micro-enterprise support to meet PAPs' needs for capital and other inputs for rehabilitation of livelihoods  
Institutional arrangements to manage rehabilitation and income restoration programs on a sustainable basis

**6. PUBLIC PARTICIPATION AND CONSULTATION**

Consultation with and role of stakeholders at different stages of the project  
Participation of households in implementation, public information booklet  
Institutional mechanism to facilitate participation  
Indicate procedures used for PAPs' participation at various stages in the project

**7. GRIEVANCE REDRESSAL MECHANISM**

Existing and project specific mechanisms, procedures for filing complaints, hearing and decisions  
Process and time-table proposed for consultation with stakeholders, particularly with the project affectees  
Institutional set-up for grievance redress

**8. ORGANIZATIONAL SET-UP**

Organization structure of the institution responsible for management, supervision and implementation of R&R activities  
Organogram indicating the organizational set-up of the agency responsible for implementation of R&R and its relationship with other related agencies, both governmental and non-governmental  
Resources available for R&R including staffing, technical and financial resources  
Budget for R&R agency, including extent of financial authority  
Co-ordination mechanisms between R&R agency, local administration, line agencies, PAPs and NGOs

**9. MONITORING AND SUPERVISION**

Monitoring indicators  
Institutional responsibilities, frequency of monitoring  
Participatory monitoring - PAPs and NGOs  
Procedures for remedial actions  
Monitoring reports

## **10. COST ESTIMATES AND BUDGET**

Aggregate costs for each type of asset loss

Costs for rehabilitation and income restoration programs, initial capital investment, sources of funds, recurring costs for continued provision of rehabilitation services and mitigation measures

Costs by different phases of implementation and/or financial year

Costs of administrative overheads/implementation management

Contingencies etc.

Sources of funding of costs for various R&R components

Budgetary process and timing of expenditure

## **11. IMPLEMENTATION MECHANISM**

Implementation procedures proposed for delivery of key elements and explanatory notes to clarify salient points where necessary.

- land-for-land provisions, including the location, quality, and present economic use of the land
- modality of compensation payment and transparency
- provision made to compensate tenants/share-croppers, squatters and others with temporary tenure
- transitional arrangements during relocation
- provisions made to compensate the loss of incomes and livelihood of PAPs either temporary or permanently
- acquisition of common property (adat land) and shared resources, procedures for assessment of compensation for such resources and properties

Preparation of schedule for implementation of RAP, description of different activities, sequence

Time-table for implementation of different activities in relation to the implementation of project

Identification of critical path and key elements in the implementation process which will have significant bearing on the implementation schedule

## **APPENDICES TO RAP**

A. Database of Relocatees

B. Locational Maps

C. Other background information

**INDONESIA**  
**RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT**  
**Economic Cost Benefit Analysis: Sugarmill Cogeneration**

[US\$ million, 1996 Prices]

YEAR	COSTS					BENEFITS			NET BENEFITS
	Total Investment Cost	O & M Cost	Annual Production	Variable Cost	Off-season Bagasse Cost	TOTAL COSTS	Energy Sales to Consumers	Tariff Revenue + Consumer Surplus	
	US\$ mill	US\$ mill	Gwh	US\$ mill	US\$ mill	US\$ mill	Gwh	US\$ mill	
1	6.67	0.00	0.00	0.00	0.00	6.67	0.0	0.00	-6.67
2	2.59	0.46	20.62	0.10	0.04	3.19	17.5	3.15	-0.04
3	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
4	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
5	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
6	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
7	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
8	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
9	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
10	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
11	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
12	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
13	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
14	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
15	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
16	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
17	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
18	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
19	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
20	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
21	0.00	0.46	61.86	0.30	0.04	0.80	52.6	9.46	8.66
NPV	8.02	3.09	379.68	1.87	0.23	13.20	322.73	58.09	44.89
IERR									74%

**INDONESIA****RENEWABLE ENERGY SMALL PRIVATE POWER PROJECT****Selected Documents in the Project File**

1. Project Implementation Plan (PIP)
2. Spreadsheets underlying IERR calculations