

**ASIAN DEVELOPMENT BANK**

**TAR: INO 35139**

**TECHNICAL ASSISTANCE**  
(Financed from the Japan Special Fund)

**TO THE**

**REPUBLIC OF INDONESIA**

**FOR PREPARING THE**

**REGIONAL POWER TRANSMISSION**

**AND COMPETITIVE MARKET DEVELOPMENT PROJECT**

**December 2001**

## CURRENCY EQUIVALENTS

(as of 28 November 2001)

Currency Unit	–	Rupiah (Rp)
Rp1.00	=	\$0.000096
\$1.00	=	Rp10,400

## ABBREVIATIONS

ADB	–	Asian Development Bank
BLT	–	build-lease-transfer
BOO	–	build-own-operate
BOT	–	build-operate-transfer
DGEEU	–	Directorate General for Electricity and Energy Utilization
IPP	–	independent power producer
PLN	–	Perusahaan Listrik Negara, Indonesia: state electricity enterprise
PPA	–	power purchase agreement
TA	–	technical assistance

## WEIGHTS AND MEASURES

cct-km circuit-kilometers	–	unit of transmission line length
GWh gigawatt-hour	–	unit of energy, equal to 1 million kWh
km kilometer	–	unit of distance
kV kilovolt	–	unit of voltage, equal to 1,000 volts
kWh kilowatt-hour	–	unit of energy
MVA megavolt-ampere	–	unit of apparent power
MW megawatt	–	unit of power

## NOTE

In this report, "\$" refers to US dollars.

## I. INTRODUCTION

1. During the Country Programming Confirmation Mission of the Asian Development Bank (ADB) in March 2001, the Government of Indonesia (the Government) and ADB agreed to include in ADB's 2001 technical assistance (TA) program, a project preparatory TA to the state electricity enterprise, Perusahaan Listrik Negara (PLN), for preparing the regional power transmission and competitive market development project. The Fact-Finding Mission visited Indonesia in September 2001 and reached an understanding on the TA's rationale, scope, terms of reference, cost estimates, and implementation arrangements with the Government and the concerned agencies.<sup>1</sup> The preliminary TA framework is attached as Appendix 1.

## II. BACKGROUND AND RATIONALE

2. The formulation of power sector development policies is the responsibility of the Ministry of Energy and Mineral Resources, which discharges its control and regulatory functions through the Directorate General for Electricity and Energy Utilization. PLN is responsible for the development and operation of the power sector. The Ministry for State-Owned Enterprises exercises the sole shareholder's powers on behalf of the Government. PLN's total installed power generation capacity reached 20,760 megawatts (MW) in 2000. Its operational assets also include 24,800 circuit-kilometers (cct-km) of transmission lines, substation capacity of 50,000 megavolt-ampere (MVA), and medium and low voltage lines totaling 287,500 cct-km. Java-Bali accounts for 80 percent of PLN's energy sale and it has a unified power grid.

3. In addition to the power generated and distributed by PLN, electricity is supplied by power plants with an aggregate capacity of about 13,900 MVA that are owned and operated by large industries and businesses. Of this, about 5,600 MVA is isolated from PLN's power grid, and about 8,300 MVA is with PLN customers.

4. The 1997 Asian crisis steeply increased PLN's foreign exchange-linked interest, fuel, and power purchase costs but the electricity tariffs are being increased gradually to avoid delaying the economic recovery. Owing to the resulting lower cash flow no new investment commitments could be made during the 4-year period, 1998–2001, whereas, electricity sales increased by 33 percent. This has eroded the reserve power generation margins in many regional power grids, including Java-Bali. Even if new commitments were made in 2001–2002, such new power plants would only be available by 2004–2005 at the earliest. Further, the loading of several subtransmission lines and substation transformers in different regions of Java is getting close to the nominal capacity. PLN needs to remove critical power supply bottlenecks to avoid lowering reliability of power supply, power grid voltage dropping below the specified limit, rolling brownouts in large urban and industrial centers, and higher losses; in extreme conditions, equipment may even fail because of overloads.

5. Deterioration of power supply reliability and quality has two possible outcomes: (i) large industries and businesses would foresee this and make large investments in captive power generation capacity, which is a suboptimal economic solution with adverse environmental impact; or (ii) economic recovery will be impaired, which would have a greater impact on the poor through a contraction in labor demand. Both these eventualities should be avoided, and

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<sup>1</sup> The TA first appeared in *ADB Business Opportunities* (Internet Edition) on 3 September 2001 under the name Power Transmission for Regional Development.

this makes it critical for PLN to invest in removing transmission bottlenecks in the large load centers of Java.

6. PLN has revised the Java-Bali power development plan (2001–2005) considering four scenarios: a constrained scenario and three scenarios with low (4.1 percent), medium (5.4 percent) and high (5.7 percent) average annual economic growth. The constrained scenario assumes no new commitment for investment in capacity addition so no amount is indicated for power generation. Only the existing, ongoing, and committed power projects would be available until 2005 to meet the projected power demand in Java-Bali. The table provides an overview of PLN's Java-Bali power development plan, with information regarding the facilities and new commitments for capital investment needed for three scenarios. Further analysis of the high growth scenario appears pointless because new investment will be limited during 2001–2005. PLN will find it extremely challenging to identify sufficient resources even for the constrained scenario, and therefore, the short-term strategy is to remove the transmission bottlenecks to the important load centers so as to contain the impact on power supply reliability and quality.

#### Overview of Java-Bali Power Development Plan (2001–2005)

Function	Amount	Constrained	Low	Medium
Generation	MW	1,320	3,465	4,915
	\$ million	0	739	2,308
Transmission	Lines (km)	2,725	3,391	3,819
	Substation (MVA)	5,659	6,369	7,000
	\$ million	774	834	895
Distribution	Lines (MV)	8,751	13,620	16,838
	Lines (LV)	9,396	12,471	15,307
	Transformers (MVA)	1,533	2,115	2,568
	Connections	2,356,454	3,006,194	4,570,934
	\$ million	623	851	1,122

MV = medium voltage, LV = low voltage

Source: PLN

7. PLN is in dialogue with owners of captive power plants to seek opportunities of purchasing surplus power during the peak-demand periods. Although it is essential to remove transmission bottlenecks, further expansion of transmission and distribution systems has to be coordinated with firm commitments for power generation additions in order to maintain a reasonable level of service to consumers. PLN has sought assistance from the Japan Bank for International Cooperation to implement the Tanjung Jati B coal-fired project with 1,320 MW,<sup>2</sup> repower the Muara Karang natural gas-based combined-cycle plant adding 420 MW, and expand the Muara Tawar oil-based combined cycle plant by adding 1,640 MW. PLN has also sought assistance of the World Bank for transmission lines and substations associated with these power projects. Experts from the Chubu Electricity Power Company, Japan, and Institute of Energy Economics, Japan, are preparing a Japan International Cooperation Agency-funded study titled, "Optimal Electric Power Development in Indonesia." The study focuses on Java-Bali and it has two themes: verifying the probability of power deficits and plans for short-term countermeasures (until 2005), and preparing a comprehensive and realistic medium- and long-term power development programs (2006 and beyond). The Government will share with ADB the reports of this study.

<sup>2</sup> Implementation of the Tanjung Jati-B project started in 1995 but it was mothballed in 1998 following difficulties in arranging project finance. About 30 months would be needed to complete the project once commitments for new project loans are finalized.

8. ADB's policies require that an appropriate legal and regulatory framework be established to encourage the private sector to make new investments in power generation capacity, and accordingly, it is extending support for implementing the Government's power sector restructuring policy.<sup>3</sup> The restructuring has been delayed, mainly because of the other changes that Indonesia is undergoing. A new draft electricity law is currently being debated in the House of Representatives and it is now expected that the law will be enacted by March 2002, the regulatory body will be established by the end of 2002, and a competitive electricity market would be established in Java-Bali by 2006. Accordingly, during the next five years, the requisite market facilities (telemetering and communication equipment, and computer hardware and software) will be put in place to complement the ongoing capacity building efforts.<sup>4</sup>

9. There are significant imbalances in the availability of power across the regions. Outside Java-Bali, PLN faces a severe power supply shortage situation, some regions to the extent of 20 percent in 2000. Considering the high-level of public debt, it is advantageous to plan for meeting a better part of the supply shortages through power plants financed by the private sector. The power grids outside Java-Bali are fragmented and relatively small so the new power plants would be of 100–150 MW size. For this, a suitable framework has to be developed for private sector participation in power projects outside Java-Bali. A reexamination of the project finance models is needed to allow for suitable alterations to address the specific situation in Indonesia to help prepare “bankable” projects. It is necessary to strengthen transmission systems, particularly in areas poorly served with power supply, in order to improve availability of energy throughout the country.

10. The proposed project has been categorized as “B” for environmental consideration, e.g., judged to have some adverse environmental impacts, but of lesser degree and significance than those judged as category A projects. An initial environmental examination will be carried out according to ADB guidelines to determine whether or not significant environmental impacts warrant an environmental impact assessment. An initial social impact assessment has been carried out. Poverty is a major reason for households to limit electric use. In turn, electricity has little effect on improving household welfare of the poor as relatively few of the poor can use electricity for productive purposes. The direct impact of the Project on the situation of the poor is expected to be marginal. However, during project preparation and implementation, the impact of the project on job opportunities will be monitored carefully.

### III. THE TECHNICAL ASSISTANCE

#### A. Objectives

11. The TA will help prepare a project to improve regional power transmission and develop a competitive electricity market in Java-Bali. The Project will include high priority transmission lines and substation components in several regions of Java and Kalimantan which will also facilitate the introduction of a competitive model. The Project will help to (i) decrease the transmission losses by removing transmission constraints, (ii) increase the reliability of supply by ensuring the appropriate rating of transmission lines, (iii) increase the quality of supply by restoring the voltage level at high-load substations, and (iv) integrate power market. The Project will have direct impacts such as the reduction of transmission and distribution losses, and indirect impacts such as increased willingness to pay for electricity due to a better quality of supply. A better quality of supply will also enhance industrial and commercial output and

<sup>3</sup> Loan 1673-INO: *Power Sector Restructuring Program*, for \$380 million, approved on 23 March 1999.

<sup>4</sup> TA Loan 1674-INO: *Capacity Building for Establishment of a Competitive Electricity Market*, for \$20 million, approved on 23 March 1999.

productivity, which will benefit labor markets and, therefore, the poor. Required market facilities for establishing and operating the Java-Bali competitive electricity market will also be implemented. The TA will also help prepare a new framework for private sector participation in power projects outside Java-Bali, which is needed to overcome existing supply shortages and restore normal economic activities. Wider private sector participation in the power sector would free up scarce government resources for other purposes, such as social services. Further, the Project is part of ADB's operational strategy for the power sector in Indonesia to diminish risks of power shortages in Java-Bali, support the ongoing power sector restructuring and establishment of a competitive electricity market, and catalyze technical support for greater private sector participation.

## **B. Scope**

12. The TA will have two parts. Part A will be the design and engineering of the transmission line components in Java-Bali and Kalimantan, which PLN will carry out in-house. The environmental and social aspects will be designed and documented according to ADB procedures. International individual consultants will review an agreed list of key tasks done by the PLN team. Part B will help prepare a new framework for private sector participation in power projects outside Java-Bali. The outline terms of reference are given in appendixes 2 and 3.

13. The TA will take into account ADB policies on poverty reduction, the energy sector, the environment, social dimensions, participatory development processes, good governance, and anticorruption.

## **C. Cost Estimates and Financing Plan**

14. The total cost of the TA is estimated at \$710,000 equivalent, consisting of \$465,000 in foreign exchange costs and \$245,000 equivalent in local currency cost. The Government has requested ADB to finance \$500,000 equivalent, covering the entire foreign exchange cost and \$35,000 equivalent of the local cost. The TA will be financed by ADB on a grant basis from the Japan Special Fund, funded by the Government of Japan. The Government and PLN will finance the remaining local currency cost of \$210,000 equivalent. The detailed cost estimates and financing plan are shown in Appendix 4. The Government has been advised that ADB's approval of the TA does not commit ADB to finance any subsequent program or project.

## **D. Implementation Arrangements**

15. PLN will be the Executing Agency for both parts of the TA. While designing the Project, the changing role of PLN in Indonesia power sector, which is undergoing restructuring (para 8), will be carefully addressed. PLN will constitute an in-house team for preparing the project proposal. The person in charge of the task force will be responsible for overall coordination with ADB, the Government, consultants, and nongovernment organizations. A project steering committee chaired by PLN's director for planning will be established and will include representatives from the Directorate General for Electricity and Energy Utilization, Ministry of Finance, Ministry of State-Owned Enterprises, National Development Planning Agency, and PLN. The steering committee will supervise and monitor the output of the TA and will meet at monthly interval. The Government agreed to provide all available relevant information. The Government will also help ensure adequate cooperation from local government bodies and nongovernment organizations active in the project area.

16. ADB will engage the services of international and domestic consultants according to its *Guidelines on the Use of Consultants* and other arrangement satisfactory to ADB on the engagement of domestic consultants. The international individual review consultant for Part A

will have expertise in power system planning, design, construction and operations, and ADB policies and loan processing procedures. The task will take about 2 person-months. The domestic consultant will have expertise in editing and report preparation (6 person-months). For Part B, a consulting firm will be engaged and the international experts (11 person-months) will have had experience developing private or public-private sector power projects, and their expertise will include (i) generation planning, (ii) formulation of public policies for infrastructure, (iii) investment banking, and (iv) negotiation of power purchase agreements for power projects developed by the private sector. The total estimated effort is thus 19 person-months of consulting services (13 person-months of international and 6 person-months of domestic experts).

17. For Part A, PLN will provide the review consultant with office space, local transport, communication facilities, other administrative support including secretarial and translation services, and arrangements for travel outside Jakarta, if needed. For Part B, PLN will also provide office space, local transport, and communication facilities. The consultant will make own arrangements for translation and administrative support. If office equipment is needed for the TA, it will be procured by the international consultants in accordance with ADB's *Guidelines for Procurement*.

18. PLN has already commenced preparatory work on Part A and is expected to complete the feasibility study of the transmission line components by February 2002. The individual consultant under the TA and the ADB project team will review PLN's feasibility study in March 2002. Guidance will be provided to PLN's in-house team to ensure that ADB requirements are being met and to facilitate finalization of the feasibility study by June 2002. This will enable processing of the ensuing loan in 2002.

19. For Part B, the consulting firm will be engaged by ADB in May 2002. It will prepare an interim report in three months, which will be reviewed by the Government, PLN, and ADB. The tripartite meeting will be held two months later, and the consultant will submit the draft final report to ADB for review a month later. The final report will be submitted within one month of receiving clearance from ADB. Part B will be completed by October 2002

#### **IV. THE PRESIDENT'S DECISION**

20. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance to the Government of the Republic of Indonesia in an amount not exceeding the equivalent of \$500,000 for the purpose of preparing the Regional Power Transmission and Competitive Market Development Project, and hereby reports such action to the Board

## TECHNICAL ASSISTANCE FRAMEWORK

Design Summary	Performance Indicators/ Targets	Monitoring Mechanisms	Assumptions and Risks
<p><b>Goal</b></p> <ul style="list-style-type: none"> <li>• Maintain quality of power supply</li> <li>• Facilitate electricity trade on a competitive basis in Java-Bali</li> <li>• Utilize private sector resources for growth of power generation capacity outside Java-Bali</li> </ul>	<ul style="list-style-type: none"> <li>• Power supply parameters to normally remain within specified limits</li> <li>• Market information to be readily available and electricity trade to be transparent</li> <li>• Increase the proportion of private sector financing for adding power generation capacity outside Java-Bali</li> </ul>	<ul style="list-style-type: none"> <li>• Annual PLN Statistics</li> <li>• Monthly performance reports to be prepared by the system operator</li> <li>• Annual capital budget of Perusahaan Listrik Negara (PLN)</li> </ul>	<ul style="list-style-type: none"> <li>• The critical requirements are based on an assumption that the average annual economic growth rate during the period 2001-2005 will be lower than four percent</li> <li>• Lack of new power generation capacity may lower the quality of power supply</li> </ul>
<p><b>Purpose</b></p> <ul style="list-style-type: none"> <li>• Prevent overloading of transmission lines and transformers in substation that supply power to important load centers in Java</li> <li>• Interconnect East and South Kalimantan power grids</li> <li>• Implement market facilities needed for operation of the Java-Bali competitive electricity market</li> </ul>	<ul style="list-style-type: none"> <li>• In 2004, the substation voltage in important load centers to be within five percent of rated voltage and power flow through transformers to be less than 80 percent of the rated capacity</li> <li>• Increase the reserve margin of the combined power grids to 25 percent</li> <li>• Make all trade-related electrical information available at the load dispatch center and capability to process the information</li> </ul>	<ul style="list-style-type: none"> <li>• Electrical parameters measurements at substations</li> <li>• Electrical parameters measurements at substations</li> <li>• Electrical parameters measurements at load dispatch center</li> </ul>	<ul style="list-style-type: none"> <li>• An outage of more than one transmission line or transformer supplying power to a load center may still cause overloading of other operating equipment</li> <li>• Lack of coordination between the regional governments may delay project implementation</li> <li>• Approval of regulatory body for the market rules will be obtained by February 2003</li> </ul>

(Reference in text: page 1, para. 1)

<b>Design Summary</b>	<b>Performance Indicators/ Targets</b>	<b>Monitoring Mechanisms</b>	<b>Assumptions and Risks</b>
<ul style="list-style-type: none"> <li>Develop a new framework for private sector participation in power generation project outside Java-Bali</li> </ul>	<ul style="list-style-type: none"> <li>Develop a concept and the process for the consideration of the Government of Indonesia (the Government) that would facilitate private sector investment in power projects under a balanced risk sharing arrangement</li> </ul>	<ul style="list-style-type: none"> <li>Policy change initiated by the Government and total generation capacity built by the private sector</li> </ul>	<ul style="list-style-type: none"> <li>The outcome of ongoing renegotiations of earlier power purchase and need for greater transparency in selection of project developers may negatively influence Government's ability to obtain support of all stakeholders for further private sector participation in the power sector</li> </ul>
<p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Project preparatory report written by PLN team for Part A, which incorporates suggestions of the international review consultant</li> <li>Study report for Part B prepared by the international consultant</li> </ul>	<ul style="list-style-type: none"> <li>Draft final report will be submitted by June 2002</li> <li>Draft final report will be submitted by October 2002</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly progress report of the TA implementation</li> <li>Quarterly progress report of the TA implementation</li> </ul>	<ul style="list-style-type: none"> <li>Adequate expertise and capacity of PLN project team</li> <li>Lack of ownership by the Government</li> </ul>
<p><b>Activities</b></p> <ul style="list-style-type: none"> <li>Detailed engineering design of transmission lines and substations</li> <li>Consultation with affected persons and local administration for obtaining right of way</li> </ul>	<ul style="list-style-type: none"> <li>The engineering design will be based on internationally accepted practices so that international competitive bids can be invited for procurement of equipment</li> <li>Right of way for transmission lines to be obtained prior to award of contract for equipment supply</li> </ul>	<ul style="list-style-type: none"> <li>TA review missions</li> <li>Progress reports by the international consultants</li> </ul>	<ul style="list-style-type: none"> <li>The consultation process for obtaining right of way for construction of the transmission lines may require longer time and additional support from the local government</li> </ul>

Design Summary	Performance Indicators/ Targets	Monitoring Mechanisms	Assumptions and Risks
<ul style="list-style-type: none"> <li>For Part B, consultation with PLN's renegotiation team</li> </ul>			
<p><b>Inputs</b></p> <ul style="list-style-type: none"> <li>For Part A International review consultant Domestic consultant PLN project team</li> <li>For Part B International consultant</li> <li>Total costs ADB costs</li> </ul>	<p>2 person-months 6 person-months 60 person months</p> <p>11 person-months \$710,000 \$500,000 from the Japan Special Fund</p>	<ul style="list-style-type: none"> <li>TA review missions</li> <li>Progress reports by the consultant</li> </ul>	<ul style="list-style-type: none"> <li>Full ownership of the TA by PLN</li> </ul>

**OUTLINE TERMS OF REFERENCE FOR PART A  
(Review of the Transmission System Components:  
Project Preparatory Work of PLN's In-house Team)**

**A. Power System Planning and Engineering**

1. The consultant will (i) review least-cost generation expansion and long-term transmission master plans up to the year 2010 and comment on the assumptions, methodology, computer models, and completeness of data used; (ii) present an analysis of the results of these studies; (iii) verify and confirm that the proposed transmission development programs are part of the long-term transmission master plan; (iv) review the detailed engineering design of project components and provide inputs if any, to make it suitably robust; (v) review the project implementation schedule and prepare a Gantt chart showing the schedule; (vi) show the project's critical path, the timing for each activity; and (vii) prepare a project procurement schedule, giving the key milestone dates.

**B. Economic Analysis and Poverty Impact Assessment**

2. The consultants will do the following:

- (i) Carry out an economic analysis based on the *Guidelines for Economic Analysis of Projects of the Asian Development Bank*, specifically including: (a) power demand analysis; (b) least-cost and equalizing discount rate analysis; (c) poverty impact analysis; (d) economic viability analysis; and (e) risk analysis. Discuss and justify the method used for carrying out the economic analysis.
- (ii) Assess the pro-poor impact of the project in terms of ADB's poverty reduction strategy, taking into account rural electrification and other linkage effects. Identify the poor to non-poor ratio of project beneficiaries, the likely distribution of project benefits among the poor and non-poor, and suggest ways to make the project pro-poor. If there is a lack of data or improvements are possible to improve the understanding of project impact on the poor, recommend a suitable methodology for future use.
- (iii) Review the summary land acquisition and resettlement plan and provide suggestion to improve it where possible. Also review the assessment of project environmental benefits, comment if the approach is reasonable, and suggest if other factors should also be considered.
- (iv) Review and explicitly discuss the assumptions and the economic parameters used in the economic analysis, including the assumed consumers' willingness to pay and resource cost savings in relation to alternative options. Compare the shadow prices with those in ADB's or the World Bank's earlier, similar projects and discuss the source and justification for the shadow prices.

**C. Financial Issues**

3. The consultants will analyze the financial governance and financial management functions of the Perusahaan Listrik Negara (PLN), including

- (i) a thorough review of the internal controls within PLN to ensure that they are consistent with ADB's Guidelines on Prevention of Fraud and Corruption;

- (ii) the salient features of the accounting and financial management practices, including delegation of authority, cost control and budgeting processes, and financial performance measurement;
- (iii) how accounts are audited (both internal and external audit); comments on the auditing standards used and adequacy of the auditing arrangements; and training requirements for auditing;
- (iv) recommended measures for improving the organization structure for the financial management functions; the scope for using computer-based systems for accounting and financial management; and the requirements in training and training facilities for accounting and finance professionals; and
- (v) suggest financial covenants for the proposed project loan to PLN, considering that it is being unbundled and the successor companies in Java-Bali will eventually be privatized.

4. The basic responsibility for preparing the review documents and carrying out the analysis will be with the PLN in-house team. The consultants will review the work and provide comments and recommendations to help improve the quality of PLN's report on project preparation.

**OUTLINE TERMS OF REFERENCE FOR PART B  
(Developing a new Framework for Private Sector Participation  
in Power Generation Projects Outside Java-Bali)**

**A. Scope of Work**

**1. Review**

1. The consultants' activities will include the following:

- (i) Review the build-operate-transfer (BOT) model of non- or partial-recourse project financing as used for implementation of power plants. Assimilate papers and study reports on project financing, create a bibliography, and identify how the information is relevant in the Indonesian context. For the purpose of this study, other variations of the BOT model, such as the build-own-operate (BOO), build-lease-transfer (BLT), and build-own-operate-transfer (BOOT) will be included in the review.
- (ii) Review the past experience of using this model in Indonesia (BOO was used extensively). The scope of the review need not include commercially sensitive information but will focus on the process used to select developers, site preparation done prior to negotiations with the independent power producers (IPPs), negotiation for finalizing power purchase agreements (PPAs), arranging for financing and financial closure, type of structures and instruments used to address project risks and make projects "bankable", award of engineering-procurement-construction, fuel supply, and maintenance contracts, and other related activities.
- (iii) Discuss with the Perusahaan Listrik Negara (PLN) renegotiation team to ascertain their view of the imbalance in the terms and conditions of the existing PPAs for preparing the new balanced and sustainable framework. The discussions will not include commercially sensitive information and other aspects that may have a direct influence over the discussions being held with IPPs.

**2. Proposed Projects**

2. The consultants' activities will include the following:

- (i) Review PLN's list of probable power projects outside Java-Bali that can be offered for private sector participation. The project financing model will initially be used only for small conventional power plants (fossil fuel-based and hydropower plants of 25–100 megawatt [MW] installed capacity). It will also be used for implementing projects in regions and areas where vertical unbundling is not planned during the next 10-15 years. Compile and review information regarding power demand and supply forecasts and justification of least-cost generation planning.
- (ii) Describe the existing institutional arrangements for developing the proposed projects. Take into consideration PLN's plans for reorganization (creation of strategic business units and jointly owned subsidiaries). Review the business plans for the relevant region to ensure that the proposed projects will be commercially viable. For this purpose, analyze the tariff structure for the relevant regions. Power purchase by itself need not be the reason for increase in retail

electricity tariff. The review of the business plans will indicate the optimum cost of bulk power from the proposed projects that can be allowed with existing tariffs.

- (iii) Review the available specifications of the proposed power plants, including whether these will be operated at base load or otherwise, fossil-fuel based or hydropower plants, if developers can offer alternate technologies, if variation in capacity of individual plants is possible, etc.
- (iv) Recommend the site preparations that will be needed to minimize construction risks and expedite project implementation once the IPPs are selected. The schedule for project development activities should be considered.

### **3. Selection of Independent Power Producers**

3. The activities to be carried out by the consultant will include:

- (i) Review the existing regulations for selection of IPPs and related regulations (tax, company establishment, license, etc.) and make recommendations, if changes are necessary.
- (ii) Suggest a modality suitable for implementing the proposed power projects through private sector participation. Project financing or balance sheet financing possibilities should be considered. Other possible alternative models should be considered, such as public-private partnership, joint ventures, lease, BLT, BOT, and BOO. Factors that need to be considered include the useful life of the project and term of debt used to build the project. The modality should also have a provision for reviewing the terms in case of unforeseen events, and change in ownership of the project or the entity to which it sells power.
- (iii) Prepare a matrix of risks to be considered during project development, implementation, and operations. Quantify the risks. The matrix will identify the agency directly responsible for causing/averting the situation that would cause the risk, and how best to address the risk. Note which risks can be covered through commercially available insurance or guarantee.
- (iv) Analyze what else is needed to minimize the risks and to make the project "bankable." Instruments such as escrow accounts, greater equity by project developers, part ownership of the project by the power purchaser and equipment suppliers, should be considered.
- (v) Prepare suitable outline PPAs that can be used for the different types of proposed projects. One outline may not be appropriate for all types of projects. The structure of the PPAs must allow for a sustainable commercial arrangement with balanced commercial, legal, and technical terms and conditions. The operational and administrative matters will also be balanced.
- (vi) Prepare the basis for selection of the IPPs through international competition. The proposed power projects have to be based on getting the lowest economic cost of power for the consumers on a sustainable basis. The consultant will examine the amount of detail that the bidders will be required to submit, and this should be kept to the minimum. Innovative bids will result in better competition and lower price.
- (vii) Prepare a selection and procurement process that is transparent and offers the least opportunity for corrupt practices, including a general draft of a

comprehensive bid solicitation document. Prepare an example of the detailed information required in draft bid documents and its analysis (e.g., of avoided costs) in relation to the projects being bid for, to encourage genuine competition between bidders. Formulate the procedures and objective evaluation criteria for awarding power projects, which are designed to foster competition and cost-effective development of the power sector.

- (viii) Suggest a follow-up process that will ensure implementation of the power project according to the terms of the agreement (cost and time).

## **B. Implementation of the Study**

4. The consultant will carry out the study in Jakarta. PLN and the Government will provide information about use of BOT model in Indonesia. PLN will provide information about the proposed projects. Extensive discussions will be necessary with PLN management to evaluate the project risks. About three months will be needed for the consultant's field team to prepare the interim report. It will cover all the tasks but will be further reviewed by the Government, PLN, ADB and other experts in the consulting firm. The review will be completed in one month, and the consultant will then return to Jakarta for another round of discussions. A tripartite meeting will be held to review the interim report. Based on the discussions during the tripartite meeting, the consultant will prepare the draft final report.

5. ADB will engage an international consulting firm to carry out the study under the technical assistance. The firm should not have a conflict of interest, i.e., it should not be providing services for PPA renegotiations, or other project development activities to any of the IPPs with operating power plants in Indonesia. The consultant's field team will comprise a project leader and three other experts, all with extensive experience in providing advice for development of private sector power projects. One expert will be a qualified engineer with experience in generation planning, another will be an economist with experience in formulation of public policies for infrastructure, the third will have experience in investment banking, and the fourth will be a legal expert with experience in negotiating contracts for IPP projects. The field team will provide 11 person-months of services. To facilitate the field work, the consulting firm may take administrative support of an Indonesian firm for which a lump sum provision will be considered in the contract. The field team will visit Jakarta twice, once to prepare the interim report, and later for the tripartite meeting and preparation of the draft final report. For the peer review of the interim report, the consulting firm will provide 1 person-month service in the home office of at least two experts who have extensive experience developing (or assisting in developing) private sector power projects.

**COST ESTIMATES AND FINANCING PLAN**  
(\$'000)

	Part A		Part B		Total
	FC	LC	FC	LC	
<b>A. Asian Development Bank Financing<sup>5</sup></b>					
1. Consultants					
a. Remuneration and Per Diem					
i. International Consultants	50	–	275	–	325
ii. Domestic Consultants	–	24	–	–	24
b. International and Local Travel	20	–	40	–	60
c. Reports and Communications	1	–	6	–	7
2. Administrative Support	–	–	–	3	3
3. Representative for Contract Negotiations	–	–	4	–	4
4. Contingencies	14	6	55	2	77
<b>Subtotal (A)</b>	<b>85</b>	<b>30</b>	<b>380</b>	<b>5</b>	<b>500</b>
<b>B. Government Financing</b>					
1. Office Accommodation and Transport	–	10	–	–	10
2. Remuneration and Per Diem of PLN Staff	–	120	–	–	120
3. Repots and Communications	–	20	–	–	20
4. Translation Services, Consultants' Reports, Secretarial Support and Office Suppliers	–	30	–	–	30
5. Contingencies	–	30	–	–	30
<b>Subtotal (B)</b>	<b>–</b>	<b>210</b>	<b>–</b>	<b>–</b>	<b>210</b>
<b>Total</b>	<b>85</b>	<b>240</b>	<b>380</b>	<b>5</b>	<b>710</b>

FC = foreign cost, LC = local cost, PLN = Perusahaan Listrik Negara

Notes:

- (i) Purchase of equipment or vehicle is not envisaged.
- (ii) Workshops, oversees training and seminars are not envisaged.

Source: staff estimate

<sup>5</sup> Financed from the Japan Special Fund, funded by the Government of Japan.