

Document of
The World Bank

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Report No: 57895-ID

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US\$640 MILLION

TO THE

REPUBLIC OF INDONESIA

FOR THE

UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER

(1,040 MW) PROJECT

April 27, 2011

Indonesia Sustainable Development Unit
Sustainable Development Department
East Asia and Pacific Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective as of January 3, 2011)

Currency Unit	Indonesian Rupiah
IDR 1,000	US\$0.1114
US\$1	IDR 8,976

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

BP	Business Policy	MOF	Ministry of Finance
CPS	Country Partnership Strategy (CPS)	MOSoE	Ministry of State-Owned Enterprises
DSCR	Debt Service Coverage Ratio	MW	megawatts
EA	Environmental Assessment	NCB	National Competitive Bidding
EASIS	Indonesia Sustainable Development Unit	NPV	Net Present Value
EIA	Environmental Impact Assessment	OCGT	Open Cycle Gas Turbine
EIRR	Economic Internal Rate of Return	OP	Operational Policy
EMP	Environmental Management Plan	ORAF	Operational Risk Assessment Framework
ERR	Economic Rate of Return	PAHs	Project Affected Households
ESP	Environmental and Social Panel	PAP	Project Affected People
FD	Finance Department	PIP	Project Implementation Plan
FM	Financial Management	PIU	Project Implementation Unit
FMR	Financial Management Report	PLN	PT Perusahaan Listrik Negara
GAF	Governance and Accountability Framework (GAF)	PMU	Project Management Unit
GoI	Government of Indonesia	PRP	Project Review Panel
IA	Independent Appraiser	PSO	Public Service Obligation
IBRD	International Bank for Reconstruction and Development	QBS	Quality Based Selection
ICB	International Competitive Bidding	QCBS	Quality and Cost Based Selection
IFB	Invitation for Bid	RCC	Roller Compacted Concrete
IFR	Interim Financial Report	RIT	Resettlement Implementation Team
IMET	Independent Monitoring and Evaluation Team	SLA	Subsidiary Loan Agreement
IPPs	Independent Power Producers (IPPs)	TOR	Terms of Reference
kV	kilovolts	UCPS	Upper Cisokan Pumped Storage
LACs	Land Acquisition Committees	VSL	Variable-spread Loan
LARAPs	Land Acquisition and Resettlement Action Plans		

Regional Vice President:	James W. Adams
Country Director:	Stefan Koeberle
Sector Director:	John Roome
Sector Managers:	Franz Drees-Gross / Vijay Jagannathan
Task Team Leader:	Leiping Wang

REPUBLIC OF INDONESIA

**UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW)
PROJECT**

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INDONESIA

**UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW)
PROJECT**

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC

Indonesia Sustainable Development Department (EASIS)

Infrastructure Unit (EASIN)

Date: April 27, 2011 Country Director: Stefan Koeberle Sector Director: John Roome Sector Managers: Franz Drees-Gross and Vijay Jagannathan Team Leaders: Leiping Wang Project ID: P112158 Lending Instrument: SIL	Sector(s): Power (100%) Theme(s): Infrastructure services for private sector development (100%) Environmental Assessment Screening Category: A
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Project Financing Data:

Proposed terms:
 The variable spread loan has a final maturity of 24.5 years including a grace period of 9 years.

Loan Credit Grant Guarantee Other:

Source	Total Amount (US\$M)
Total Project Cost:	800.0
Cofinancing:	
PLN:	160.0
Total Bank Financing:	640.0
IBRD	640.0
IDA	0.0
New	
Recommitted	

Borrower: Republic of Indonesia
 Responsible Agency: PT **PERUSAHAAN LISTRIK NEGARA (PLN)**
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 Tel: (62-21) 725-1234 Fax: (62-21) 722-1330
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Estimated Disbursements (Bank FY/US\$ m)

FY	2012	2013	2014	2015	2016	2017	2018	2019
Annual	5.0	45.0	150.0	150.0	150.0	50.0	50	40.0
Cumulative	5.0	50.0	200.0	350.0	500.0	550.0	600	640.0

Project Implementation Period: Start: December 1, 2011		End: December 31, 2018
Expected effectiveness date: December 1, 2011		
Expected closing date: December 31, 2018		
Does the project depart from the CAS in content or other significant respects?		<input type="radio"/> Yes <input checked="" type="radio"/> No
If yes, please explain:		
Does the project require any exceptions from Bank policies?		<input type="radio"/> Yes <input checked="" type="radio"/> No
Have these been approved by Bank management?		<input type="radio"/> Yes <input type="radio"/> No
Is approval for any policy exception sought from the Board?		<input type="radio"/> Yes <input checked="" type="radio"/> No
If yes, please explain:		
Does the project meet the Regional criteria for readiness for implementation?		<input checked="" type="radio"/> Yes <input type="radio"/> No
<p>Project Development Objective:</p> <p>The development objective is to significantly increase the peaking capacity of the power generation system in Java-Bali in an environmentally and socially sustainable way and strengthen the institutional capacity of the project implementing entity (PLN) in hydropower planning, development and operation.</p>		
<p>Project description:</p> <p>The Project consists of three components:</p> <p>Part 1: Development of the Upper Cisokan Pumped Storage Power Plant.</p> <p>(a) Dam and Appurtenant Structures and Access. (b) Transmission Lines. (c) Project implementation support, including assistance in pre-construction engineering design, procurement, and construction management and supervision. (d) Project administrative activities to be conducted by the Project Implementation Unit.</p> <p>Part 2: Social and Environmental Impact Management.</p> <p>(a) Land Acquisition, Resettlement and Livelihoods Restoration. (b) Environment Management.</p> <p>Part 3: Feasibility Study and Preparation of Design and Bid Documents for Matenggeng Pumped Storage Power Project, and related Capacity Building.</p> <p>(a) Provision of support for the undertaking of a feasibility study and the preparation of basic design and bid documents for the future planned Matenggeng Pumped Storage Project. (b) Provision of capacity building assistance to PLN for the planning, development and operation of hydropower projects, especially pumped storage hydropower projects.</p>		

Safeguard policies triggered?	
Environmental Assessment (OP/BP 4.01)	• Yes ○ No
Natural Habitats (OP/BP 4.04)	• Yes ○ No
Forests (OP/BP 4.36)	○ Yes • No
Pest Management (OP 4.09)	○ Yes • No
Physical Cultural Resources (OP/BP 4.11)	• Yes ○ No
Indigenous Peoples (OP/BP 4.10)	○ Yes • No
Involuntary Resettlement (OP/BP 4.12)	• Yes ○ No
Safety of Dams (OP/BP 4.37)	• Yes ○ No
Projects on International Waters (OP/BP 7.50)	○ Yes • No
Projects in Disputed Areas (OP/BP 7.60)	○ Yes • No

Conditions and Legal Covenants:

Loan/Project Agreement Reference	Description of Covenant	Date Due
Loan Agreement Section 5.01	The Additional Condition of Effectiveness consists of the following: (a) the Subsidiary Loan Agreement has been executed on behalf of the Borrower and the Project Implementing Entity; (b) the Location Determination for the Project shall have been issued.	Prior to the Effectiveness Date
Project Agreement Schedule Section I.A	The Project Implementing Entity shall: (a) appoint to the Principal Project Office a Project Engineer with qualification, experience and terms of reference satisfactory to the Bank; and (b) establish the Procurement Committees with adequate composition, institutional arrangements, functions and resources.	Within 90 days and 30 days, respectively, of the Effectiveness Date
Loan Agreement Schedule 2 Section I.B and I.C and Project Agreement Schedule Section I.B and I.C	Each of the Borrower and the Project Implementing Entity shall ensure that the Project is carried out in accordance with the Project Implementation Plan and the Procurement Manual, the Anti-Corruption Guidelines and the Governance and Accountability Framework.	During implementation
Project Agreement Schedule Section I.B, paragraph 3	The Project Implementing Entity shall not commence any bid tendering for civil works (excluding the Access Roads), and shall not withdraw the proceeds of the Loan for any such civil works, until all final designs have been reviewed by the Project Review Panel and are acceptable to the Project Implementing Entity and the Bank.	Prior to bid tendering for civil works (excluding access roads)
Loan Agreement Schedule 2 Section I.D and Project Agreement Schedule Section I.D	The Borrower shall take measures necessary to enable the Project Implementing Entity to, and the Project Implementing Entity shall, ensure that the Project is carried out in accordance with the provisions of: the Environmental Management Plan and Supporting Plans, the Land Acquisition and Resettlement Action Plans and the Dam Safety Plan.	During implementation
Loan Agreement Schedule 2 Section I.D paragraph 3 and Project Agreement Schedule Section I.D paragraph 11	The Borrower and the Project Implementing Entity shall ensure that Part 2 of the Project (including land acquisition, resettlement and rehabilitation) is financed exclusively out of its own or other resources and not out of the proceeds of the Loan.	During implementation
Project Agreement Schedule Section I.D paragraph 5 and paragraph 9	The Project Implementing Entity shall maintain at all times until completion of the Project the independent Environmental and Social Panel and the independent Project Review Panel, in each case with staffing and terms of reference acceptable to the Bank.	During implementation

Project Agreement Schedule Section I.D, paragraph 6	In the event that the final Project design includes a small hydropower plant option, then prior to commencing any activities related thereto, the Project Implementing Entity shall: (a) prepare applicable environmental and social safeguards documents in compliance with the Bank's policies in form and substance satisfactory to the Bank; (b) submit such documents to the Bank for review and no-objection; (c) adopt and locally disclose such documents; and (d) thereafter implement all actions required to be taken by the Project Implementing Entity in accordance with such documents in a manner satisfactory to the Bank.	During implementation
Project Agreement Schedule Section I.D paragraph 13	With respect to works undertaken along the Access Roads right of way prior to commencement of the Project, the Project Implementing Entity shall ensure that an independent monitor acceptable to the Bank and under terms of reference satisfactory to the Bank shall assess whether any loss of assets, income sources or livelihood occurred and in the event of any such loss, shall implement measures in accordance with the provisions of the applicable LARAP.	During implementation
Project Agreement Schedule Section I.D paragraph 16	The Project Implementing Entity shall, in accordance with the requirements of the Ministry of Forestry, provide replacement land for the productive forest land acquired for the purposes of the Project, in accordance with the provisions set out in the Project Agreement.	During implementation
Project Agreement, Schedule, Section I.D, paragraph 15 and Loan Agreement Schedule 2 Section I.D, paragraph 4	<p>In carrying out Part 3 of the Project, the Project Implementing Entity shall: (a) prepare environmental and social safeguards documents and procedures as part of the feasibility study and basic design and bid documents for such proposed hydropower project in accordance with environmental and social safeguard guidelines, policies and procedures acceptable to the Bank, including acceptable measures for public consultation and disclosure of relevant documents to the public; and (b) submit such documents to the Bank for review.</p> <p>The Borrower and the Project Implementing Entity acknowledge that the Bank makes no commitment to fund and/or supervise the implementation of such project and the Borrower acknowledges that the Bank shall not be held responsible for, and hereby agrees to hold the Bank harmless from, any liabilities associated with such project in the event that the Borrower or the Project Implementing Entity obtains financing for such project from sources other than the Bank and/or applies national standards or the standards of such financiers in the design, construction and/or operation of such project.</p>	During implementation
Loan Agreement Section II.A and Project Agreement Schedule Section II.A	The Borrower and the Project Implementing Entity shall monitor and evaluate the progress of the Project and prepare semi-annual Project Reports on the basis of the agreed indicators. The Project Implementing Entity shall prepare and furnish to the Bank, interim unaudited financial reports for the Project covering the quarter, in form and substance satisfactory to the Bank.	Not later than forty-five (45) days after the end of the period
Loan Agreement Schedule 2 Section II.B and Project Agreement Schedule Section II.B paragraphs 1 - 3	Each of the Borrower and the Project Implementing Entity shall have its Financial Statements audited by independent auditors acceptable to the Bank in accordance with terms of reference satisfactory to the Bank. Each audit of such financial statements shall cover the period of one (1) fiscal year of the entity. The audited Financial Statements for each such period shall be furnished to the Bank.	Not later than six (6) months after the end of the period
Project Agreement Schedule Section II.B, paragraph 4	The Project Implementing Entity shall maintain a debt service coverage ratio of 1.5 times.	During implementation

I. Strategic Context

A. Country Context

1. Indonesia has made remarkable progress over the last decade in terms of macroeconomic and political stability. Macroeconomic performance since the late 1990s has seen consistent output growth and rapid decline in external imbalances. With inflation under control and rising incomes, Indonesians have been enjoying improving living standards and poverty levels have fallen, although many remain close to the poverty line. Indonesia was less affected by the global economic downturn of 2008-09 than most economies, and by late 2009 the economy had recovered to grow faster than pre-crisis averages. The outlook is that Indonesia's economic momentum will continue to build, with growth rising above 6 percent in 2011, and with scope for growth to average 7 percent by mid-decade, despite the weaker global economic outlook. Indonesia's fiscal position also remains strong, providing Indonesia with options for providing additional resources for meeting infrastructure development priorities. Successful implementation of priority infrastructure projects will be essential for Indonesia to emerge as a strong middle income country in the coming decade.

B. Sectoral and Institutional Context

2. Indonesia has very rich energy resources. At the end of 2007, Indonesia's natural gas reserves reached 165 trillion cubic feet, the greatest share in the Asia Pacific region. Reserves for oil for the same year were estimated at 8.4 billion barrels and for coal 18.7 billion tons, ranking the 3rd largest and the 5th largest in the region, respectively¹. In addition, Indonesia is rich in renewable resources, especially hydropower, biomass and geothermal. The development of these primary energy resources, however, has been unbalanced. While the reserve life index² for oil is only around 24 years, a large part of Indonesia's vast gas and renewable energy resources have not been exploited or developed.

3. The geography of Indonesia as well as the distribution of population and economic activities divides the electricity systems in Indonesia into distinctly different parts: (i) the Java Bali interconnected power system with around 23,000 MW installed generation capacity; (ii) over 20 isolated small power grids with generation capacity ranging from 12 MW to around 2,000 MW on major islands outside of Java and Bali; and (iii) hundreds of isolated mini-grids mainly supplying electricity to rural consumers in remote areas on both Java-Bali and outer islands. The Java-Bali system is a large and modern power system, providing electricity to over 60 percent of the population and economic activities in Indonesia. Most of the small and mini grids, on the other hand, are much less sophisticated, and some of them are mainly diesel based with very high generation cost and low supply reliability.

4. The state owned national power company, PT Perusahaan Listrik Negara (PLN) Persero has the mandate for providing electricity in Indonesia. It is a vertically integrated power company, generating, transmitting and distributing most of the electricity in the country. Acting as the single authorized buyer at the wholesale level, PLN buys electricity from an increasing

¹ Source: the Ministry of Energy and Mineral Resources of Indonesia, 2007.

² Reserves divided by current maximum production.

number of Independent Power Producers (IPPs) and some large captive power plants. A significant share of installed generation corresponds to captive power plants, mainly owned by industrial consumers supplying electricity to their own facilities and/or as a back-up to PLN's supply.

5. According to PLN's ten year development plan,³ the peak demand of the Java-Bali power system will reach around 42,770 MW in 2019 with a maximum daily peak and off-peak demand difference of over 14,000 MW. In the meantime, the total incremental generation capacity from 2010 to 2019 will amount to around 36,000 MW, of which around 70 percent will be base-load power plants, such as geothermal and coal fired power stations. To meet the increasing peaking demand and the challenges of significant increase of the base-load power generation capacity, the proposed Upper Cisokan and the Matenggeng pumped storage hydropower projects have been planned for commissioning before 2020.

6. The power sector is now facing the following challenges to sustain economic growth and social development:

- ***Electrification ratios remain low, while robust and sustained economic growth is driving the demand for electricity to grow at an annual rate of over seven percent.*** Around 70 million⁴ people still do not have access to electricity, or electricity supply is extremely unreliable. To reach the Government's target of electrifying 90 percent of the population by 2020, the power sector will need to connect roughly two million new subscribers annually, double the rate of the past few years.
- ***Non-optimal generation fuel mix and low electricity price lead to large and unsustainable Government subsidies to PLN.*** Fossil fuel dominates the fuel mix and oil fired power plants account for around 30 percent of the total generation capacity, one of the highest in the region. The electricity price level, though increased by around 6 percent in mid 2010, is still among the lowest of most of the countries in the region and lower than the cost of supply. PLN's financial viability is reliant upon the Government's public service obligation (PSO) subsidy, expected to be around 36 percent of total revenues in 2010, raising doubts about the long-term sustainability of this financial support mechanism.
- ***The frequent restructuring of PLN in the past decade weakens its capacity to efficiently operate and expand a large and modern power system.*** A major area of focus is to rebuild PLN's capacity for planning and developing large infrastructure projects in a sustainable way.
- ***The Java-Bali power system will face acute peaking and supply reliability risks without sufficient increase of flexible peaking capacity in the mid-term.*** The quality and efficiency of power supply are much lower than those of the international best practices of modern power systems at sizes similar to the Java-Bali system. The expected commissioning of a large capacity of base-load coal fired power plants in the next few years will further worsen this situation. Improved reliability is also a requirement of a

³ RUTPL 2010-2019, PLN

⁴ World Bank, "Electricity for All", 2006.

competitive wholesale power market, which is the long term goal of the Java-Bali power system.

7. The government's energy sector strategy is focusing on: (a) facilitating private investments and increasing public financing to grow supply capacity; (b) improving the generation fuel mix by developing coal fired and renewable energy; (c) rationalizing the electricity tariff and subsidy regime; and (d) further strengthening institutional capacity and improving the management efficiency of PLN.

C. Higher Level Objectives to which the Project Contributes

8. In line with the Bank's Country Partnership Strategy (CPS) and GoI's strategic priorities, the Bank is supporting: (a) a large investment lending program to finance public sector power infrastructure projects, especially renewable energy and transmission projects, to sustain economic growth; (b) development policy lending programs to support GoI's efforts to establish a sustainable policy environment for infrastructure project development and move the energy sector towards a low-carbon development path; and (c) technical assistance to rationalize the electricity tariff and subsidy regime, establish incentives for geothermal resource development, and strengthen the capacity of national state-owned companies in the energy sector.

9. The proposed project provides the Bank with a unique opportunity to: (a) support the development of Indonesia's large public sector infrastructure projects which are critically important for the mid and long term growth of the national economy; (b) introduce the Bank's rich and updated global experience in sustainably developing large pumped storage and hydropower projects in developing countries to the Bank's counterparts in the country; and (c) strength the institutional capacity of the national power company of Indonesia in planning, developing and operating large pumped storage hydropower projects.

10. The proposed project is consistent with the CPS for Indonesia FY2009-2012, which *inter alia*, supports the building of effective and accountable institutions in the power sector. It will contribute to the country program by: (a) improving the business climate by better meeting the increasing demand for electricity (in line with Core Engagement 1 for supporting private sector development); and (b) strengthening the technical, managerial and operational capacity of PLN to implement large scale investment projects (in line with Core Engagement 2 for supporting infrastructure development).

II. Project Development Objectives

A. PDO

11. The development objective is to significantly increase the peaking capacity of the power generation system in Java-Bali in an environmentally and socially sustainable way and strengthen PLN's institutional capacity in hydropower planning, development and operation.

B. Beneficiaries

12. Project beneficiaries include people who receive electricity supply from the Java-Bali power system, a population of around 134 million.

C. PDO Level Results Indicators

13. Achievement of the development objective will be assessed through the following indicators: (a) increases in peaking capacity; because of the project; (b) percentage of project affected households (PAHs) that have achieved increased/restored incomes or assets; (c) evidence of satisfactory compliance with the Environment Management Plan (EMP); and (d) improved capability of PLN in planning, development and operation of hydropower pump storage power projects in accordance with international practice.

III. Project Description

A. Project Components

14. The Project has three components. Each component is described below (See Annex 2 for a detailed project description).

Component 1: Development of the UCPS Power Plant

- a) **Dam and Appurtenant Structures and Access.** Development, construction and operation of the UCPS Power Plant in West Java at the catchment of the Upper Cisokan River with an installed capacity of 1,040 MW, including: (i) the construction of (A) a new Lower Reservoir with approximately 10 million cubic meters of active storage impounded by a roller compacted concrete (RCC) dam with a maximum height of approximately 98.0 meters, and (B) a new Upper Reservoir with approximately 10 million cubic meters of active storage impounded by a RCC dam with a maximum height of approximately 75.5 meters; (ii) the construction of waterway structures including two headrace tunnels with a total length of approximately 2,380 meters connecting the Lower Reservoir and Upper Reservoir, an underground powerhouse, an outdoor 500 kilovolts (kV) switchyard, and related hydraulic metal works and building works; (iii) the installation of the generator-motor and related electrical equipment with an installed capacity of approximately 4x260 MW, and the installation of hydraulic pump-turbine and auxiliary equipment with an installed capacity of approximately 4X275 MW; (iv) project preparatory works, including construction of the Access Roads (widening of existing road segments and construction of new road segments) from the existing quarry at Gunung Karang to the Upper Reservoir and Lower Reservoir construction sites; and (v) installation of a short 20 kV distribution line to assist with construction power needs.
- (b) **Transmission Lines.** Construction of two double circuit 500 kV transmission lines to connect the UCPS Power Plant to the existing Java-Bali power system at Cibirong-Saguling line.

- (c) Provision of support for implementation of the above activities, including assistance in pre-construction engineering design, procurement, and construction management and supervision.
- (d) **Project Administration.** Provision of support for project administrative activities to be conducted by the Project Implementation Unit (PIU).

Component 2: Social and Environmental Impact Management

- (a) **Land Acquisition, Resettlement and Livelihoods Restoration.** Provision of support for the implementation of the Land Acquisition and Resettlement Action Plans (LARAPs), including resettlement, rehabilitation, compensation and livelihoods development measures that will improve, or at least maintain, people's pre-project living standards and income earning capacity.
- (b) **Environment Management.** Provision of support for the implementation by the Project Implementing Entity of the Environmental Management Plan (EMP) and Supporting Plans.

Component 3: Feasibility Study and Preparation of Basic Design and Bid Documents for Matenggeng Pumped Storage Power Project, and related Capacity Building

- (a) Provision of support for the undertaking of a feasibility study and the preparation of basic design and bid documents for the future planned Matenggeng Pumped Storage Project in Central Java with a planned installed capacity of approximately 880 MW, including: (i) updating of previous studies to verify engineering and economic feasibility and preparation of basic design and bid documents, and (ii) preparation an environmental impact assessment study and the development of land acquisition and resettlement plans.
- (b) Provision of capacity building assistance to PLN for the planning, development and operation of hydropower projects, especially pumped storage hydropower projects.

15. A small hydropower plant at the lower dam to mainly serve the local communities and/or share profits with the local communities may be constructed to benefit from the natural water-flow and the water-head to be created by the lower dam. During project implementation, the project engineer will conduct the feasibility study of the small hydropower project. If feasible, PLN may decide to finance the small hydropower project under the proposed Upper Cisokan project with its own financing resources or seek additional financing from the Bank.

B. Project Financing

1. Lending Instrument

16. PLN, in agreements reached with the Ministry of Finance (MOF), has selected a US Dollar denominated, and commitment-linked variable spread loan (VSL) of US\$ 640 million for the project. Repayments will be annuity, with a repayment period of 24.5 years, including 9

years of grace. The Bank loan will be on-lent by MOF to PLN under a subsidiary loan agreement (SLA).

2. Project Financing Table

17. Total project financing requirements are estimated at US\$ 800.0 million, inclusive of price and physical contingencies, taxes, interest during construction, and the front-end fee. PLN will finance US\$ 160.0 million for activities under Part 2 of the Project, including land acquisition, preparatory works, project administration, tax, interest during construction, and the front-end fee. The remaining costs of US\$ 640.0 million for goods, works, and contingencies will be funded by the Bank. The costs of pre-construction engineering and construction supervision services, and the services of the independent Project Review Panel (PRP) and the independent Environmental and Social Panel (ESP) will be retro-actively financed by the Bank out of the US\$ 640 million IBRD loan. Detailed information on costs and financing sources is provided in Table 1

IV. Implementation

A. Institutional and Implementation Arrangements

18. PLN will be the implementing agency; a task force called Project Management Unit (PMU) will be established to coordinate project implementation and reporting among relevant departments of PLN. Procurement committees, consisting of members from related functional departments of PLN, will be established to carry out procurement activities. The Corporate Finance, Budgeting, Accounting, and Treasury Divisions of the Finance Department (FD) will carry out disbursement, financial management, monitoring and reporting. The Java Bali Hydropower Generation Principal Project Office will be the PIU in charge of supervising the construction of the project, including the implementation of the EMP and the LARAPs, project monitoring and reporting, and be the focal point for project communications. The PIU with around 30 staff members has been established and major staff members have been recruited.

19. A qualified international engineering consultant (the project engineer) will be recruited to assist PLN in the pre-construction engineering, procurement, and construction supervision. The project engineer will also be responsible for the development and implementation of related parts of the EMP, and monitoring EMP implementation. An independent Project Review Panel (PRP) of experts, consisting of internationally and nationally reputable hydropower experts, has been established to undertake periodic, comprehensive and independent reviews of the design, construction, and initial reservoir filling of the project works⁵. PLN will not commence any bid tendering for civil works (excluding the access road) until all final designs have been reviewed by the PRP and are acceptable to PLN and the Bank. An independent Environmental and Social Panel (ESP) of experts, consisting of internationally and national reputable environmental and social experts, has been established to provide PLN with independent advice on both environmental and social aspects of project design and implementation, and regarding measures to enhance the overall environmental and social outcome of the project.

⁵ The objectives of the reviews are to assure: safe, economic and state of the art designs; efficient, expeditious, and high quality construction; and proper provisions for initial filling and long-term emergency preparedness.

Table 1. Project Costs by Component and Source of Financing

		PLN	IBRD	Total
Project Cost by Component and/or Activity		(US\$ Million)	(US\$ Million)	(US\$ Million)
A	DEVELOPMENT OF UCPS PROJECT			
	Infrastructure			
1	Upper and Lower Dams	0.00	111.51	111.51
2	Waterways, Underground Powerhouse and Switchyard	0.00	151.59	151.59
3	Hydraulic Pump-Turbine and Auxiliary Equipment	0.00	80.93	80.93
4	Generator-Motor and Electrical Equipment	0.00	129.80	129.80
5	Hydraulic Metal Works	0.00	55.26	55.26
6	Building Works	0.00	5.38	5.38
7	500 kV Transmission Line	0.00	13.52	13.52
8	Preparatory Works	23.07	0.00	23.07
	Consulting Services and Administration			
1	Engineering Services	0.00	25.00	25.00
2	Project Review Panel	0.00	2.00	2.00
3	Administrative Cost	15.00	0.00	15.00
	<i>Sub-total</i>	38.07	574.98	613.05
B	SOCIAL AND ENVIRONMENTAL IMPACT MANAGEMENT			
1	Land Acquisition and Compensation	74.40	0.00	74.40
2	Environmental Management	1.96	0.00	1.96
	<i>Sub-total</i>	76.36	0.00	76.36
C	TECHNICAL ASSISTANT COMPONENT			
a)	Engineering Consulting Services, EIA, and RAP for Matenggeng Pumped Storage Project	0.00	10.00	10.00
b)	Capacity Building: Training for Subject in Hydro Power Development	0.00	2.00	2.00
	<i>Sub-total</i>	0.00	12.00	12.00
	<i>Total Base Cost</i>	114.43	586.98	701.41
	Physical Contingency	0.00	48.13	48.13
	Price Contingency	2.02	4.67	6.69
	Tax	6.32	0.00	6.32
	<i>Total Project Cost</i>	122.77	639.78	762.56
	Interest During Construction	35.91	0.00	35.91
	Front End Fee (0.25%)	1.60	0.00	1.60
	TOTAL FINANCING REQUIRED	160.28	639.78	800.06

Note: Base costs are at early 2011 price level. Exchange rate US\$ 1 = Rp. 9,000.

20. The Land Acquisition Committees (LACs) will be established by related government agencies to conduct land acquisition in accordance with the agreed LARAPs. In parallel, a Resettlement Implementation Team (RIT) consisting of PLN staff and staff members of related local government agencies will be established to implement the resettlement and livelihood restoration program defined in the LARAPs. A qualified independent appraiser (IA) will be employed to evaluate the values of the assets and land to be acquired. Finally, an independent monitoring and evaluation team (IMET) consisting of PLN staff and independent professionals will be set up to monitor and evaluate the overall implementation of the LARAPs.

21. The project (including land acquisition and construction of the new section of access road) will be implemented during a period of around 72 months starting late 2011. A project implementation plan (PIP), agreed with the Bank, has been adopted by PLN.

B. Results Monitoring and Evaluation (Annex 1)

22. PIU will also monitor project progress, including the implementation of the EMP and LARAPs. A panel will conduct independent review and evaluation of the implementation of the EMP and LARAPs.

C. Sustainability

23. Sustainability of the proposed project will ultimately be determined by the sustainability of the power sector, and at the project level, by the proper implementation and operation of the proposed project. GoI is committed to strengthening the electricity sector's institutional capacity, along with PLN's management efficiency. It is also taking key measures to rationalize the electricity tariff and subsidy regime to improve the financial sustainability of PLN and improve the sector's investment climate.

24. PLN has demonstrated a high level of commitment to the project through project preparation and well established project management capacity. Extensive training and capacity building will be provided under the technical assistance component to build PLN's capacity to operate the proposed project.

25. Economic and financial sustainability is very likely because: (a) the project is technically sound, and construction will be supervised and managed by international consultants with strong experience in developing large hydropower projects; (b) the pumped storage plant is part of the least cost power generation system expansion plan and its economic benefits to the system are very robust; and finally, (c) the project is financially viable and displaces very high cost generation that contributed to PLN's financial problems following the high increase of petroleum products prices. Environmental and social sustainability is also very likely given PLN's efforts to adhere to best practice in safeguarding the environment and seeking wide acceptance of the project by concerned communities at all stages of project development.

V. Key Risks and Mitigation Measures

26. The proposed project will be the first pumped storage and the largest hydropower generation facility (in terms of installed capacity) in Indonesia. Key potential risks are summarized in the Operational Risk Assessment Framework (see Annex IV). The overall risks are rated high. Key risks identified include: (a) delays in land acquisition and resettlement; (b) the relatively large number of people to be affected by the project, and the fact that some resettlement activities have already taken place along the rehabilitated existing access road as part of the project preparatory works; (c) procurement of large contract packages; (d) seismic conditions of the project area⁶; and (e) lack of experience in managing large hydropower projects. Mitigation measures have been agreed with project agencies and will be monitored carefully during project implementation.

VI. Appraisal Summary

A. Economic and Financial Analysis

Economic Analysis

27. **Cost Effectiveness.** A least-cost study on expansion of the generation system in Java and Bali was undertaken by PLN during the project preparation using WASP IV, an accepted dynamic programming model, to determine the least cost solution to meet the demand. The study considered a low and base load forecast covering a 20 year period from 2010 to 2030. The proposed project is part of the least-cost plan and is expected to be commissioned in the earliest possible years of commissioning.

28. **Cost-Benefit Analysis.** A cost-benefit analysis was carried out to estimate the economic internal rate of return (EIRR) of the proposed project. The EIRR was estimated at 19.0 percent, and would: (a) decrease to about 16.0 percent, if the investment cost increases by 20 percent; and (b) decrease to 15 percent, if the prices of liquid fuels decrease by 40 percent. The sensitivity and risk analyses indicate that changes in the important variables will not fundamentally affect the economic viability of the project.

Financial Analysis

29. **PLN's Financial Performance and Financial Condition.** PLN's financial condition continues to be substantially reliant upon GoI subsidy which covers the shortfall between electricity tariffs and PLN's cost of power supply.⁷ This PSO subsidy, which GoI is mandated to pay by law, was 37 percent of PLN's total revenues in 2009, and is expected to be at around 36 percent of total revenues in 2010.

30. PLN is expected to continue to remain profitable (with the PSO subsidy contributing to revenues) during 2010 with a net profit of Rp. 10.3 trillion (US\$1.15 billion) as compared to a

⁶ Indonesia is recognized internationally as a country with high seismic risks.

⁷ The Government is obliged to pay a public service obligation subsidy under the State Owned Enterprise Law 19/2003. In addition, MOF Decree No. 111/PMK.02/2007 ensures that the difference between sales and cost of production is covered.

net profit of Rp. 10.4 trillion (US\$1.1 billion) in 2009. PLN's operating revenues (excluding PSO) are expected to increase from Rp. 91 trillion (US\$ 9.9 billion) in 2009 to Rp. 104 trillion (US\$11.6 billion) in 2010. A major contributor to this higher expected operating revenue was the 9.3 percent increase in energy sales combined with a tariff increase during the second half of 2010. PLN also remains sufficiently liquid and has adequate headroom to absorb the necessary debt to finance its investment program and its operations, so long as GoI meets its PSO obligations to PLN.

31. **PLN's Financial Projections.** PLN expects an average annual sales growth of around 14 percent from 2011 to 2016. Combined with projected average annual tariff increases of 5 percent over the same period, PLN expects revenues (excluding GoI's subsidies) to grow at an average annual rate of about 14 percent during 2011-16. As a result of the higher tariffs, and the corresponding higher revenues as a proportion of costs, Government subsidies are expected to decline over the projection period, from 37 percent of total revenues in 2011 to 25 percent of total revenues in 2016. Net income, after taxes, will remain relatively unchanged in absolute terms at Rp. 8.4 trillion (US\$ 877 million) in 2016, compared to Rp. 8.9 trillion (US\$ 980 million) in 2011 and is expected to decline as a percentage of total revenues (from 4.7 percent of revenues in 2011 to 2.9 percent of revenues in 2016) mainly due to the high interest expense and finance charges for the debt being assumed to finance its capacity expansion program. However PLN shall continue to remain sufficiently liquid over the same duration with an average year end cash balance of Rp. 8 trillion (US\$ 860 million).

32. **Monitoring PLN's Financial Condition.** The key financial measure to monitor PLN's financial viability would be the company's liquidity. PLN is expected to remain liquid for the duration of the project with an average year-end cash balance of Rp. 8 trillion (US\$ 860 million). PLN has also received on January 17, 2011, a ratings upgrade to Ba1 by Moody's, one notch below investment grade, and the same as the sovereign. However, PLN is undertaking a significant investment program while the sector is undergoing a reform in pricing and subsidies that may impact its financial condition. PLN's financial condition would therefore need to be monitored closely in the next few years to ensure that its financial strategy remains relevant to keep it on a strong financial footing.

33. In view of PLN's current and projected financial information, the financial covenant of the debt service coverage ratio (DSCR) of 1.5 times which is the same as the ongoing Java Bali Power Sector Restructuring and Strengthening project, (Loan 7758-ID), and the Power Transmission Development Project, Loan (7940-ID) is considered to be appropriate for this project.⁸

34. **Project Financial Rate of Return.** It is estimated that the project has a pre-tax FRR of 16.1 percent and a positive NPV of Rp. 2.9 trillion.⁹ The weighted average cost of capital assumed for PLN is 12 percent based on a realized WACC for 2010 of 9.8 percent and an

⁸ PLN's debt service coverage is expected to be 2.34x as of end 2010.

⁹ PLN calculates taxes on a consolidated basis for the entire corporation, and not on a project basis. It therefore feels that unlike coal fired plants that produce sufficient power to generate profits that would contribute to PLN's tax burden, this project (with an average 4 hours of generation per day) is not being developed to generate profits, but rather to reduce PLN's operating costs by substituting oil with hydro. The approach used for determining the project FRR is also conservative as it uses actual tariffs, and expenses instead of using avoided costs through oil substitution.

expected higher WACC in future years. The project therefore provides a positive benefit to PLN's financial condition.

35. A detailed analysis of PLN's financial condition is provided in Annex 9.

B. Technical

36. The feasibility study of the project was conducted in the mid 90s and the detailed design was carried out in 2001 to 2002. In 2007, a supplementary detailed design was also conducted. All these studies were conducted by experienced international consultants according to internationally accepted criteria and standards. However, the detailed design of the project is around ten years old and will be reviewed by the PRP and updated at pre-construction engineering stage to reflect technology developments in the past decade. Given the generally high seismic risk nature of Indonesia, the seismic design of the two dams will also be reviewed by the PRP.

37. The PRP, established in 2010, has confirmed the technical feasibility of the project and also provided substantial comments on the detailed engineering designs of the project. PRP comments can be divided into two main groups: (i) comments related to dam safety and/or essential technical aspects of the project design, mostly related to seismic risks; and (ii) suggestions and recommendations aimed at optimizing the design, with the main objective of reducing project costs and/or shortening construction time. These issues can and will be satisfactorily addressed by the project engineer at pre-construction engineering stage and the updated design will be reviewed by the PRP and agreed by the Bank and PLN before issuing the bidding documents for the main civil works.

38. The terms of reference (TOR) for the project engineer has been reviewed and cleared by the Bank, is a part of the request for proposal issued to shortlisted consultants. The project engineer is expected to be selected around mid-2011.

39. With the assistance of the PRP members, the project investment cost estimates were updated by an experienced international consultant to reflect PRP's main comments on the seismic design of the two dams. Under the most conservative scenario (without considering any design optimizations), changes of the dam design could result in an increase of the project cost by up to 3.3 percent. Thus updating the design will not change the economic viability of the project.

C. Financial Management

40. The financial management (FM) assessment has been conducted by the Bank and actions to strengthen PLN's financial management capacity have been agreed with PLN. The assessment has concluded that with the implementation of the agreed actions, the proposed financial management arrangements are adequate to provide, with reasonable assurance, accurate and timely information on the status of the loan required by the Bank.

41. The project has two major FM risks: (a) the PIU is newly established and is not yet familiar with project administration, project payment verification process, or the Bank requirements on financial reporting; and (b) possible delay in Parliamentary approval of SLA budgets that could cause delays in availability of funds to PLN.

42. The FD of PLN has provided training on project accounting and payment verification process to relevant staff of the PIU. Training on IFRs will be provided to project staff at the beginning of the project implementation. To address the issue of possible delay of Parliament's approval of the SLA budget, PLN has decided to prepare the project budget plan earlier to give enough time for the parliament to review and approve the budget.

43. Annex 3 provides additional information on financial management implementation arrangements. The detailed financial management capacity assessment and arrangements are available in the project files.

D. Procurement

44. A procurement assessment has been carried out and concluded that PLN has adequate experience and basic capacity to carry out procurement activities related to the proposed project. PLN is familiar with Bank procurement procedures through its experience in implementing past projects financed by the Bank. However, the project will consist of procurement of high-value civil works, equipment and consulting contracts. Furthermore, delay in the selection of consultants, especially for large consulting contracts, is not uncommon in Indonesia.

45. Risk mitigation measures have been discussed with PLN and agreed. The procurement plan for the project has been found acceptable. It will be updated at least annually (or as required) to reflect project implementation needs. A brief summary of procurement capacity assessment, the project procurement arrangements and risk mitigation measures is provided in Annex III.

46. A Governance and Accountability Framework (GAF) has been developed for the project to mitigate fraud and corruption risks. It summarizes the actions that have been agreed to and will be undertaken by PLN to reinforce project governance, thereby enhancing transparency of project activities, increasing public accountability, and reducing opportunities for corruption, collusion or fraud. The GAF is available in project files.

E. Social

47. The major social impact of the project is land acquisition and household relocation. The total area of land affected is about 833 ha of largely agricultural and forestry areas, of which 716 ha will be acquired; 51 ha will be under the 500 kV transmission lines and with height restrictions; and about 65 ha at the existing quarry and existing access road is already owned by PLN. Of the 716 ha of land to be acquired, about 489 ha is privately used agricultural land, the rest is forestry land owned by PT Perhutani, a state owned forestry company¹⁰

¹⁰ Estimates of forest land acquisition were also done by PT. Perhutani, separately and independently of the census of affected people and inventory of their assets. PT. Perhutani estimates forest land acquisition of 382 ha, of which only an estimated

48. Land acquisition will affect 7,159 people in 1,485 households. In addition, up to 434 households are affected on land already owned by PLN, and 286 households will have height restrictions on structures or trees under the transmission lines. Of those affected, 3,929 people in 733 households are expected to be relocated or physically displaced. The predominant income of the population is from farming very small lots of rice and/or cultivating fruits and vegetables. Approximately 36 percent of households are at or below the poverty line, compared to 17.75 percent nationally. There are no indigenous people living in the project area as defined by the OP 4.10, based on the detailed census conducted.

49. Of all those affected, only 202 households possess letters of land ownership, 1,501 own their land but lack formal letters of ownership. In addition, there are squatters, sharecroppers or wage earners without any title, but whose job locations are likely to be affected due to the construction of the project. The vulnerable or severely affected population is estimated at about 800 households, namely those already below the poverty line, disabled, elderly, or widowed, and include about 240 households without alternative land of their own to reconstruct their homes.

50. The project is expected to have other social impacts as well. PLN encourages local hiring by contractors where skills are available. Up to 1,500 workers are needed at the peak of construction activity, 60 percent of whom may be unskilled. Common construction-related issues such as noise, traffic hazards, dust, and disturbances and health issues from workers are anticipated, however the local population will also benefit from jobs and a demand in local enterprise / services. There could be a large group of service providers attracted to the project areas as well. The influx of population will increase public health risks, HIV and STD diseases in particular, to both the construction workers and the local population. The relocating households would also be vulnerable to health impacts during the relocation process. A gender action plan and a detailed environmental management plan have been developed to address gender issues and public health issues of PAPs, construction workforce, and local communities in the project areas.

51. The project triggers OP4.12 Involuntary Resettlement, and three land acquisition and resettlement action plans (LARAPs) have been drafted and disclosed to address project impacts in compliance with both GOI and World Banks' relevant policies for: (a) access roads and quarry; (b) lower and upper dams and reservoirs (including resettlement sites); and (c) associated transmission lines. The LARAPs detail the socioeconomics in the project areas, resettlement planning activities, project impacts, entitlement policies and packages, resettlement and rehabilitation approaches and packages, including a pre-feasibility study and initial conceptual design for three relocation sites (out of nine sites considered), implementation arrangements, institutional, monitoring and grievance redress mechanisms, cost and financing arrangements. The LARAPs are acceptable to the Bank.

52. As part of the preparatory works, the 6.7 km of the existing access road was rehabilitated and widened in 2010. The land affected is owned by PLN, and occupied by some local people

154.48 ha was included in the LARAP census of affected people. The LARAP census only measured land used or claimed by affected people, or land recognized by PAPs as forest land, therefore only the occupied portions of this forest land was covered by the resettlement census and inventory of assets. The portion of the forest land unoccupied is therefore estimated at 227.52 ha (382 ha minus 154.48 ha) and will also be acquired. State and Forest land encroachments require a legal survey to clarify ownership, which will be done during implementation.

under agreements with PLN indicating that when needed by PLN, they will move away from the land. 83 structures were partially affected and none of the project affected people (PAP) were relocated. A completion report received from PLN for the LARAP implementation records the actual impacts and recommends needed follow-up. Monitoring follow up surveys will be conducted to confirm that livelihoods were not affected; in case of any loss of livelihoods, PLN will address them in a manner consistent with the LARAP. This agreement has been documented in the LARAP for access road.

53. Implementation of the LARAPs requires the location determination to be issued by the Government of the West Java Province where the project will be located. PLN and related government authorities are working closely for the document to be issued in a timely manner, so that land acquisition can start as planned. Issue of the location determination is a condition of effectiveness of the proposed loan.

F. Environment

54. The project is rated as a Category A. The Bank environmental and social safeguards policies that apply to the project include: (a) Environmental Assessment (OP/BP 4.01); (b) Natural habitats (OP/BP 4.04); (c) Physical cultural resources (OP/BP 4.11); (d) Involuntary settlement (OP/BP 4.12); and (e) Safety of dams (OP/BP 4.37).

55. Environmental and social impact assessments were conducted in 1995, 1998, 2001, and 2007. During 2008 and 2009, additional studies were carried out to further assess the project's impacts on downstream users, biodiversity, physical cultural resources, and connectivity of local communities. A consolidated EA and an updated EMP were prepared in 2010 to update the previous studies and summarize the new investigations undertaken in 2008 and 2009. In early 2011, the EA and EMP were revised based on the comments of the Bank. The final version of the documents dated on March 15, 2011 comply with Bank requirements.

56. As part of the EMP, a number of sub-plans were developed. These sub-plans include: (a) a biodiversity management plan, which documents an adaptive management approach to biodiversity conservation/protection; (b) a physical cultural resources management plan; (c) access road construction environmental management plan; (d) transmission line environmental management plan; (e) environmental specifications for contractors; (f) quarry environmental management plan; and (g) the reservoir clearance management plan. Detailed guidelines or terms of reference were also developed for: the construction worker camp management plan; the social and community management plan; and the operation environmental management plan. These three plans will be developed by contractors and the project engineer, and will be reviewed and agreed by the Bank three months prior to the start of the construction of the main works or the commissioning of the project. In addition, a watershed management plan will be developed during the early years of project implementation. This plan will be implemented by PLN during the operation of the project.

57. *Dam Safety.* The dam safety plan developed by PLN has been reviewed and agreed by the Bank. Some of the PRP comments on the detailed design of the project related to dam safety, will be addressed by the project engineer during the pre-construction engineering design.

58. *ESP.* The ESP, established in 2011, provided guidance on resettlement strategy and implementation of the EMP. The ESP report will be provided to the project engineer and selected contractors, and disclosed publicly.

59. *Consultation and Disclosure.* The EIA, EMP and LARAPs have been disclosed locally in local language and in the Infoshop. During the preparation of the EA, the EMP, and the LARAPs, a number of public consultations were conducted. Participants in the consultations included representatives of PAPs, community leaders, representatives of women's groups, government officials, local parliament members, academics, media and NGOs. Major issues raised during the public consultations have been addressed during the meetings and/or in the EIA, EMP and the LARAPs.

60. *Implementation of EMPs and LARAPs.* PLN has established institutional arrangements for supervising and implementing the EMP and the LARAPs. Major positions of PLN's environmental management and LARAP implementation team have been filled with qualified professionals. The teams in related government agencies, contractors, and the project engineer, will be established after the issuing of the location determination by the West Java Provincial Government or after the contractors and the project engineer are selected.

61. Comprehensive capacity enhancement efforts have been planned and documented in the LARAPs and the EMP and the TOR for project engineer. The PIU will coordinate all the project related capacity building and training activities among contractors, project engineers, local government agencies, project affected people and other stakeholders. Major training and capacity building will be conducted before the start of project activities. Adequate budget has been allocated as part of the budgets for the project supervision (project engineer), project construction (contractors), and project management (the PIU).

62. *Matenggeng Pumped Storage Hydropower Project.* The project will finance the feasibility study of the proposed Matenggeng Pumped Storage Hydropower Project. No protected flora or endangered species were found within the project area. At the time when the pre-feasibility was carried out (late 90s), about 7000 people lived in 3 villages in the area but none were expected to be displaced by the project. Reservoirs will inundate about 1 km² (0.14 km² upper, and 0.83 km² lower reservoirs) of land, but the project was not expected any influence on future water developments downstream.

63. Safeguards instruments will be developed for the Matenggeng project in accordance with Bank environmental and social safeguard guidelines, policies and procedures. The Bank has not made any commitment to either fund or supervise the implementation of the future Matenggeng Pumped Storage Project as part of the Proposed Upper Cisokan project. The Bank will not have any responsibility for any potential liability, if PLN decides to obtain financing from sources other than the Bank, and apply either national standards or other donors' policies to the Matenggeng project, instead of implementing the safeguard policies/safeguards instruments developed under the feasibility study financed by the Upper Cisokan project.

64. *Small Hydropower Plant.* The feasibility of constructing small hydropower plant downstream of the lower dam will be investigated by the selected project engineer. PLN has agreed that if decision is made to pursue this as a new sub-component of the project, PLN will prepare applicable safeguards instruments in compliance with the Bank's safeguards policies. The Bank will be responsible for ensuring the implementation of these instruments.

65. *Replacement Land.* Indonesian regulations require PLN to provide replacement land for the productive forest land to be acquired and that the land acquisition be conducted through a willing buyer-willing seller process. It has been agreed that (a) screening for social and environmental impacts of the candidate sites will be conducted by PLN before the purchase of the replacement land, and a safeguards screening worksheet has been developed for this purpose; (b) if the screening trigger impacts on physical culture property, natural habitats, and involuntary resettlement, etc., they will be addressed by PLN after the purchase (utilizing safeguards instruments satisfactory to the Bank); (c) the transfer of the replacement land to the Ministry of Forestry will be a condition of dam and reservoir commissioning; and (d) the willing buyer-willing seller process for the purchase of the land will be documented by PLN.

66. *Communication Strategy.* A Communication strategy has been developed by PLN to (a) build grassroots support to the implementation of the project through continuous consultations and information sharing with PAPs and those indirectly affected by the project; (b) increase transparency and engagement at all levels of government, NGOs, academics, and donors by maintaining open channels of communication; and (c) support PLN in improving its information-sharing and engagement practices. This strategy has been reviewed by the Bank and will be implemented by PLN.

Annex 1: Results Framework and Monitoring

INDONESIA: UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW) PROJECT Results Framework

Project Development Objective (PDO): To significantly increase the peaking capacity of the power generation system in Java-Bali in an environmentally and socially sustainable way and strengthen PLN's institutional capacity in hydropower planning, development and operation.									
PDO Level Results Indicators	Core	Unit of Measure	Baseline (2011)	Cumulative Target Values		Monitoring			
				Mid Term Review (MTR) (Q2, 2015)	Completion (Q4, 2018)	Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
Indicator One: Increased peaking capacity because of the project	<input type="checkbox"/>	MW	0	0	1040	Once	Project report	PIU	Increases of peaking power generation capacity.
Indicator Two: Percentage of project affected households that have achieved increased/restored incomes or assets.	<input type="checkbox"/>	(%)	0	50	100	Surveys at baseline, MTR and completion	Survey reports at MTR and completion, a quantitative consumption and assets survey, as benchmark	IMET and PIU	Percentage of affected households with living standards at least at the same level at start of project operation, compared with pre-project.
Indicator Three: Evidence of satisfactory compliance with the EMP	<input type="checkbox"/>	Pending cases of non-compliance.	No pending cases	No pending cases	No pending cases	Six monthly	Supervising Engineer progress report	Project Engineer and PIU	Measures extent to which environmental impacts are minimized.
Indicator Four: Improved capability of PLN in planning, development and operation of hydropower pump storage power projects in accordance with international practice.	<input type="checkbox"/>	Satisfactory completion of training and capacity building activities.	0	Completion of 40% of the training and capacity building activities.	Completion of all the studies, training and capacity building activities.	Six monthly	Project reports; and training completion reports	The Bank Project Team and PIU	Capacity of planning, preparing and operating pumped storage hydropower projects.

INTERMEDIATE RESULTS

Intermediate Indicators	Core	Unit of Measure	Baseline (2011)	Target Values				Monitoring			
				Q4, 2012	MTR (Q2, 2015)	Q4, 2016	Completion (Q2, 2018)	Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
Intermediate Result: Upper Cisokan Pump Storage Plant Component											
<i>Intermediate Result indicator One:</i> Progress in procurement of main contracts: main works, electro mechanical equipment. Progress in selection of project engineer.	<input type="checkbox"/>	% Completion	0	50	100	100	100	Quarterly	Quarterly progress reports	PIU	Bid documents prepared = 25%; Issued = 50% Evaluation complete = 75% Contracts = 100%
		% Completion	50	100	100	100	100				
<i>Intermediate Result indicator Two:</i> Construction of dams, waterways and installation of M&E equipment.	<input type="checkbox"/>	% Completion	0	0	25	50	100	Quarterly	Quarterly progress reports	PIU	Completion of physical works and installation of equipment: 100% when enters service.
<i>Intermediate Result indicator Three:</i> Construction of 500 kV transmission line.	<input type="checkbox"/>	% Completion	0	0	0	50	100	Quarterly	Quarterly progress reports	PIU	Completion of physical works: 100% when enters service.
Intermediate Result: Social and Environment Impact Mitigation Component											
<i>Indicator One:</i> Resettlement compensation: households fully compensated.	<input type="checkbox"/>	% Compensated	0	50	100	100	100	Six monthly	Quarterly progress reports, IMET six monthly reports	IMET and PIU	Fully compensated means all lump sum payments made, recorded in resettlement record book, and taking place before construction start.
<i>Indicator Two:</i> Livelihoods development: capacity enhanced in all villages.	<input type="checkbox"/>	% Villages with active livelihood program	0	25	75	100	100	Six monthly	Quarterly progress reports, IMET six monthly reports	IMET and PIU	

Intermediate Result: Technical Assistance Component												
Progresses of the feasibility study and basic design for Matenggeng project;			No activities	Request for proposal issued	Study completed							For studies, completion means the final study reports are reviewed and agreed by PLN and the Bank. For training and capacity building, completion means that the activities are completed and evaluation reports are prepared. The evaluation results of the activities are at least moderately satisfactory.
Capacity building	<input type="checkbox"/>				50% training completed	80% training and capacity building activities completed	All the training and capacity building activities completed	Quarterly	Quarterly progress reports	PIU		

***Target values should be entered for the years data will be available, not necessarily annually.**

Annex 2: Detailed Project Description

INDONESIA: UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW) PROJECT

Introduction

1. By the end of 2010, the total installed generation capacity of PLN's and IPP's power plants amounted to 30,750 MW, of which 23,206 MW are in Java-Bali and the rest in the islands outside of Java-Bali. In Java-Bali, 19,171 MW of generation capacity is owned by PLN, the rest is owned by IPPs. Of the total installed generation capacity, coal fired power plant amounted to 33.5 percent, oil fired generation capacity 27.4 percent, gas 23.6 percent, hydropower, 11.9 percent and geothermal 3.6 percent. A large portion of gas fired power plants, however, are running on diesel, because of the unavailability of gas supply.
2. In 2010, the peak demand in Java-Bali reached 18,100 MW with an annual average load factor of 79.5 percent. According to PLN's statistics, the system annual average load factor had gradually increased from 69.5 percent in 2000 to 78.7 percent in 2008, then to 79.5 percent in 2010, partly due to suppressed demand by lack of capacity during the peaking hours in recent years. In 2010, the maximum daily difference between peak and off peak demands reached around 6,000 MW. A large portion of the peaking load is supplied by diesel fired gas turbines.
3. According to PLN, from 2003 to 2009, the electricity energy consumption of the Java Bali system increased around 35 percent. During the same period the installed generation capacity only increased by less than 23 percent. As a result, demand has been suppressed in recent years, especially during peaking hours. The system load factor had increased from around 72 percent in 2003 to 78 percent in 2009. Dispatching records of the Java-Bali system show that there was sporadic load shedding across Java-Bali and the quality of the system frequency has also been worsening in the past few years, mostly during peaking hours.
4. According to PLN's ten year development plan, the peak demand of the Java-Bali power system will reach around 42,770 MW in 2019 with a maximum daily peak and off-peak demand difference of over 14,000 MW. In the meantime, the total incremental generation capacity from 2010 to 2019 will amount to around 36,000 MW, of which around 70 percent will be base-load power plants, such as geothermal and coal fired power stations. To meet the increasing peaking demand and the challenges of significant increase of the base-load power generation capacity, the proposed Upper Cisokan and the Matenggeng pumped storage hydropower projects have been planned for commissioning before 2020..
5. The site of the proposed UCPS project was initially identified in late 1980s. The feasibility study of the project was conducted in the mid 1990s and the detailed design was completed in 2001 for commissioning before 2010. The Asian financial crisis in the late 1990s, however, significantly hindered the economic growth of Indonesia therefore delayed PLN's planned generation capacity expansion plan. In 2007, a supplementary detailed engineering design was conducted. The Bank started to prepare the project in late 2008. With installed capacity of 1,040 MW, when commissioned, the UCPS project will be the first pumped storage

power project and the largest hydropower generation facility (in terms of installed capacity) in Indonesia.

Project Location

6. The UCPS project will be located in the West Java Province of Indonesia, in the catchment of the Upper Cisokan River. It will be approximately 150 km away from Jakarta, the capital of Indonesia and the largest electric power demand center in the country, and around 30 km from Bandung, the third largest city in Indonesia.

7. The Cisokan River flows generally from south to north as a tributary of the Citarum River, which flows to the Java Sea on the north coast of Java. The Citarum River is one of the largest on Java, and already has a number of hydropower schemes along its length, the nearest to the Upper Cisokan scheme is the Cirata (downstream, at 1,000 MW) and Saguling (neighboring catchment, at 700 MW).

8. In the catchment area of the upper dam, the Cilawang, Cipateungteung, Cibima, and Cidongke rivers join the river Cirumamis. The dam will be built cross the Cirumamis River. The catchment area is about 10.5 km². In the catchment area of the lower dam, the Cirumamis River and Ciawitali River flow into the Cisokan River. The catchment area of Lower Dam is about 355.0 km².

9. The climate is tropical with highest rainfall levels occurring between September and February, and the highest temperatures from March to August. The mean annual rainfall at the site varies from 500 mm to 600 mm.

10. Geological studies of the site indicated Rajamandala formation outside Citarum formation. Upper dam river bed is andesit intrusive siltstone and sandstone. The breccia alternating sandstone is above river bed. River bed of lower dam consists of variation andesite and tuffa breccia.

11. Indonesia is located in a very active seismic zone, along the Pacific 'ring of fire'. The project area is located in Seismic Zone 4, with small to medium seismic risk for building construction (PLN/Newjec Inc., 2007b). As an example of the frequency and nature of earthquakes in the area, 62 earthquakes were recorded in the Cianjur Regency in 1992/93, located within 344km of the project site, and measuring up to 5 on the Richter scale (PT. PLN, 1998).

Project Components

12. The proposed project will have three components:

Component 1: Development of the Upper Cisokan Pumped Storage Power Plan. It will finance the development of the main physical structure of the project and consulting services, as well as project administrative costs for the project implementation unit. It will consist of three subcomponents:

- *Development of the pumped storage power facility* including: (a) the construction of a new lower reservoir with around 10 million cubic meters of active storage impounded by a roller compacted concrete (RCC) dam with a maximum height of approximately 98.0 meters, and a new upper reservoir with around 10 million cubic meters of active storage impounded by a RCC dam with a maximum height of approximately 75.5 meters; (b) the construction of waterway structures including two headrace tunnels with a total length of approximately 2,380 meters connecting the lower and upper reservoirs, an underground powerhouse, an outdoor 500 kV switchyard, and related hydraulic metal works and building works; (c) the installation of the generator-motor and related electrical equipment with an installed capacity of 4x260 MW, and the installation of hydraulic pump-turbine and auxiliary equipment with an installed capacity of 4X275 MW; (d) two associated 500 kV transmission lines to connect the power station to the Java-Bali power system (around 15 km each); and (e) project preparatory works, including construction of the access road (around 34 km including a 6.7 km section of existing road) and 20 kV distribution line for construction power supply.
- *Consulting services* to assist in pre-construction engineering design, procurement, and construction management and supervision.
- *Project administrative activities* to be conducted by the project implementation unit of PLN.

Component 2: Social and Environmental Impact Management. It will ensure the environmental sustainability and socially responsible construction and operation of the UCPS Project. It will consist of two subcomponents:

- *Land Acquisition, Resettlement and Livelihoods Restoration.* Implementation of the agreed Land Acquisition and Resettlement Action Plans, in which PLN meets its social obligations to those affected by the project. It includes resettlement, rehabilitation, compensation and livelihoods development measures that will improve, or at least maintain, people's pre-project living standards and income earning capacity.
- *Environment Management.* All the activities outlined in the agreed Environmental Management Plan (EMP) which are not already financed under Component 1 and covered by requirements placed on construction contractors or the selected project engineer. In addition, it will finance consulting services to develop a watershed management plan to be implemented during the operation of the project.

Component 3: Feasibility Study and Preparation of Basic Design and Bid Documents for Matenggeng Pumped Storage Project, and Capacity Building. It will finance two subcomponents:

- *Feasibility Study and Preparation of Basic Design and Bid Documents for Matenggeng Pumped Storage Project:* The proposed Matenggeng Pumped Storage Power Project is located in central Java with a planned capacity of around 880 MW. The objective of the proposed study will be updating of previous studies to verify engineering and economic feasibility and preparation of basic design and bid documents. In addition, the project

will finance an environmental impact assessment study and the development of land acquisition and resettlement plan for the Matenggeng project.

- The Matenggeng project will be located in Java, about 350 km southeast of Jakarta. The Project site was identified in the 1980s and a good pre-feasibility study was carried out by Electricity De France (EDF) in 1997. This study included a substantial amount of site investigation including: topographical mapping of upper and lower reservoirs and dams, seismic refraction studies along dam and tunnel alignments; 12 drill holes with a total length of 735 m; and baseline environmental studies. On this basis, the scope of the Matenggeng Pre-feasibility Study exceeds that of most feasibility studies. The World Bank reviewed the EDF report during a mission in May 1997 and was of the opinion that Matenggeng was a very good project and recommended “generally parallel development of the Upper Cisokan and Matenggeng projects”. However, as the pre-feasibility study was undertaken over ten years ago, PLN suggested and the Bank agreed that the objective of further studies should be updating of previous studies to verify engineering and economic feasibility and preparation of basic design and bid documents.
- *Capacity building for the planning, development and operation of hydropower projects, especially pumped storage hydropower projects.* The technical assistance will focus on building and strengthening PLN’s capacity in planning, developing and operating hydropower, especially pumped storage projects. The technical assistance would include on-the-job training and tailored training programs for related PLN staff to bring their skills up to current international practice. On the operation side, a priority program will be the training of PLN’s concerned staff to efficiently use and adequately maintain and operate pumped storage plants.

13. A small hydropower plant at the lower dam to mainly serve the local communities and/or share profits with the local communities may be constructed to benefit from the natural water-flow and the water-head to be created by the lower dam. During project implementation, the project engineer will conduct the feasibility study of the small hydropower project. If feasible, PLN may decide to finance the small hydropower project under the proposed Upper Cisokan project with its own financing or seek additional financing from the Bank.

Main Design Features of the UCPS Project

14. The main design features of the project are shown in Table A.2.1 below.

Table A.2.1 Main Features of the Upper Cisokan Pumped Storage Hydropower Scheme

I. Plant Data	Remarks
Rate Installed Generation Capacity – (MW)	1,040 (260 MW x 4 units)
Maximum Input – Pumps (MW)	1,100 (275 MW x 4 units)
Maximum Turbine Discharge (m ³ /s)	432
Maximum Pumping Discharge (m ³ /s)	324
Rated Net Head – generation (m)	276
Generation duration at maximum output (hr/day)	6.5
Pumping duration at maximum input (hr/day)	8.5

II. Reservoir Scale and Hydrology		Upper reservoir	Lower reservoir
River		Cirumamis River	Cisokan River
Catchment Area above the dam (km ²)		10.5	355.0
Reservoir Surface Area at high Water Level.(ha)		80	260
High Water Level (HWL) (m)		796.5	499.5
Low Water Level (LWL) (m)		777.5	495.0
Effective Depth (m)		19.0	4.5
Active Storage (m ³)		10,000,000	10,000,000
Total volume (m ³)		14,000,000	63,000,000
Average River inflow (m ³ /s)		0.4	14.9
Design Flood (1/10,000 years) (m ³ /s)		230	1,100
Bottom outlet – average – maximum discharge (m ³ /s)		0.5 – 0.96	7.0 – 13.0
Reservoir greenbelt elevation (m)		796.5 -801.5	499.5 – 504.5
III. Main Civil Construction			
1)	Roller Compacted Concrete Dams		
	Height (m)	75.5	98.0
	Crest Length (m)	375	294
	Elevation of Crest (m)	800.5	503.0
2)	Bottom Gates		
	Normal discharge capacity (m ³ /s)	0.5	7.0
	Maximum discharge capacity (m ³ /s)	0.96	13.0
3)	Centre Overflow Spillways		
	Maximum discharge capacity (m ³ /s) (to cope with 1/10,000 yr flood)	78	1,100
4)	2 Circular Headrace Tunnels		
	Length (m)	Approx, 1,220 (No. 1), 1,160 (No. 2)	
	Inside diameter (m)	7.4	
5)	2 Surge Tanks		
	Inside Diameter (m)	15.0	
	Height (m)	78	
6)	Embedded Steel Pipe Penstocks		
	Length (m)	475 ~ 530	
	Inside Diameter (m)	2 (ID = 5.9 m), 4 (ID = 4.17 ~ 3.1m)	
7)	Underground Powerhouse and Transformer		
	Height (m)	51.15	
	Max. Width (m)	26	
	Length (m)	156.6	
8)	4 Circular Tailrace Tunnels		
	Length (m)	190 ~ 270	
	Inside diameter (m)	5.2	
9)	500kV Transmission Lines		
	Route 1 north 38 towers Cibinong – Saguling (km)	15.50	
	Route 2 north 45 towers Cibinong-Saguling (km)	15.90	
10)	Switchyard	outdoors	
11)	20kV Distribution Line		
	Cianjur substation to project site (km)	30	

Source: PLN

15. The detailed design of the project is around ten years old and was reviewed by the Independent PRP during the first PRP meeting in late October, 2010. In its report of the meeting, the PRP confirmed the technical feasibility of the project and provided substantial comments on the detailed engineering designs. PRP comments can be divided into two main groups: (a) comments related to dam safety and/or essential technical aspects of the project design mostly related to seismic risks; and (b) suggestions and recommendations which are aimed at optimizing the design, with the main objective of reducing project costs and/or shortening construction time

16. Issues identified by the PRP will be addressed by the pre-construction engineering and construction supervision engineer (the project engineer) at the pre-construction engineering stage. The updated design will be reviewed by the PRP and agreed by PLN and the Bank prior to the tendering of the main civil works packages.

Operations of Pumped Storage Hydropower Generation Technology and Its Major Benefits

17. Pumped storage provides an efficient way of storing energy from other power stations during off-peak hours, and quickly releasing it when needed to meet high power demand during peak hours, evening out load variations on the power grid; and balancing the network. This helps lower the overall operation cost of power production and levels the fluctuating output of intermittent power sources. Pumped storage is the most widespread energy storage system in use on power networks. Today there are over 127 GW of pumped storage stations in operation around the world¹¹, mostly in OECD countries and China.

18. Currently, pumped storage hydropower is the only solution for efficiently storing large amounts of energy. It can act as a quick response for peak load energy supply; provide ancillary services, such as frequency and voltage regulation, black start services and reactive power sources.

19. Pumped storage systems work using two water reservoirs that are built at differing heights. Energy is stored by pumping water from the low to the high storage reservoir. Pump turbines transfer the water during low-cost off-peak hours using available surplus energy from fossil, nuclear and renewable power plants. During periods of peak electrical demand, the stored water is released through turbines for hydroelectric power generation. This allows utilities to reap financial benefits from the storing of this energy, which might otherwise be lost. Although it is a net consumer of energy, pumped storage makes economic sense because it transforms an over-supply of cheap electricity during off-peak hours into valuable peak energy. The efficiency of modern pumped storage generation technologies could be as high as 80 percent.

20. Studies undertaken and long operational practices of pumped storage power stations in many countries indicate that pumped storage power plants usually have much smaller environmental and social foot prints as they are usually built on very small rivers and with very small reservoirs. Their carbon foot prints are also very limited, or even neutral or beneficial. Although pumped storage power stations usually buy electricity for pumping from fossil fuel power plants, thereby increasing carbon emissions, they will replace peaking power generation from fossil fuel power plants which reduces carbon emissions. They also improve efficiency and reduce the start-up fuel consumptions of fossil fuel power plants by evening the demand curves, thereby reducing carbon emissions.

21. More pumped storage power plants have been built recently and more are planned in Europe and North American power markets driven by the large scale development of renewable energy resources, such as wind and geothermal resources. These pumped storage facilities are used to pump water by using electricity generated by renewable technologies when there are no electricity demands in the system, and generate electricity by releasing the water when there is a high demand in the system. By operating in this way, pumped storage power technologies are totally climate friendly.

¹¹ Source: ALSTOM.

Annex 3: Implementation Arrangements

INDONESIA: UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW) PROJECT

Project Administration Mechanisms

Project implementation institutional arrangements

1. PLN will be the implementing agency, with detailed project administration arrangements as follows:

- A task force called **Project Management Unit (PMU)** will be established in PLN headquarters to coordinate project implementation and reporting among relevant departments of PLN. The PMU will also function as the official interface with the Bank and related central government agencies regarding Bank loan approval and reporting. Under the Director for Planning and Technology of PLN, the head of the Corporate Strategic Planning Division will be the coordinator of the PMU. Other members of the PMU will be representatives of all the relevant departments and subsidiaries of PLN. The PMU Coordinator will report to the Board of Directors (BoD) through the Director of Planning and Technology.
- **Procurement committees**, consisting of members from related functional departments of PLN, will be established to carry out all procurement activities. Committee members will be staff members of PLN with procurement experience of projects financed by international development agencies and/or with power project development experience. The Department of Strategic Procurement (DSP) will coordinate procurement activities and provide secretariat supports to the procurement committees.
- **The Corporate Finance, Budgeting, Accounting, and Treasury Divisions of the Finance Department (FD)** will carry out disbursement, financial management, monitoring and reporting.
- **The Java Bali Hydropower Generation Principal Project Office** will be the PIU and be directly in charge of supervising the construction of the project, including the implementation of the EMP and the LARAPs, project monitoring and reporting, and be the focal point of the project communications. This unit will also support: (a) the PMU for project coordination; (b) the FD for financial management, reporting (including the preparation of Interim Financial Report (IFR) and Financial Management Report (FMR)), and disbursement; and (c) related Procurement Committees for reviewing bid documents and bid evaluation. The PIU has been established with around 30 staff members and major staff members have been recruited. The General Manager of the PIU will report to the BoD through the Director of Java Bali Operations.
- **Project Engineer.** A qualified international engineering consultant (the project engineer) will be recruited to assist PLN in the pre-construction engineering, procurement, construction supervision, inspection of materials and works, and testing and commissioning, as well as overall project management related to the project. The Project

Engineer will also be responsible for development, implementation of related parts of the EMP, and monitoring the implementation of the EMP.

- **PRP.** An independent PRP, consisting of internationally or nationally reputable hydropower experts has been established to undertake periodic, comprehensive and independent reviews of the design, construction, and initial reservoir filling of the project works¹².
- **ESP.** An independent ESP, consisting of internationally and nationally reputable environmental and social experts has been established to provide PLN with independent advice on both environmental and social aspects of project design and implementation, and regarding measures to enhance the overall environmental and social outcome of the project.
- **The Land Acquisition Committees (LACs)** will be established by related government agencies to conduct land acquisition in accordance with the agreed LARAPs. In parallel, a **Resettlement Implementation Team (RIT)** consisting of PLN staff and staff members of related local government agencies will be established to implement the resettlement and livelihood restoration program. A qualified **independent appraiser (IA)** will be employed to evaluate the assets and land to be acquired. Finally, an **independent monitoring and evaluation team (IMET)** consisting of PLN staff and independent professionals will be set up to monitor and evaluate overall implementation of LARAPs.
- **Contractors and suppliers** will be selected to implement related parts of the project and the EMP.
- A **grievance task force** will be established by PLN to handle complaints related to land acquisition, resettlement and livelihood restoration programs, and coordinate complaint handling activities to be undertaken by the selected contractors, and the project engineer related to construction activities and the implementation of the EMP. All the contractors and the project engineer are required to establish their own grievance task teams to handle complaints related to project activities. The functioning of the grievance mechanism will be monitored and tested by the ESP and the Bank project team during project implementation.

Measures to address capacity constraints

2. To address lack of coordination among various implementation units in financial management, reporting and procurement, a Project Engineer will be employed by PLN to provide support to: (a) the PIU on project construction supervision, monitoring and reporting; (b) the PMU on overall project coordination; (c) the FD on financial management and disbursement issues; and (d) the Procurement Committees for bid document preparation and for bid evaluation. The Project Engineer will be on board within three months of project effectiveness. In addition, training and capacity building support will be provided to PLN teams during the project implementation by the PRP, ESP and the Bank project team.

¹² The objectives of the reviews are to assure: safe, economic and state of the art designs; efficient, expeditious, and high quality construction; and proper provisions for initial filling and long-term emergency preparedness.

Financial Management, Disbursement and Procurement

Financial Management

3. A financial management assessment has been conducted by the Bank and actions to strengthen PLN's financial management capacity have been agreed with PLN. The assessment has concluded that with the implementation of the actions, the proposed financial management arrangements are adequate to provide, with reasonable assurance, accurate and timely information on the status of the loan as required by the Bank. Overall, the financial management risks for this project are assessed as "Substantial" before and "Moderate" after mitigation.
4. The project has two major FM risks: (a) the PIU in charge of supervising the project and project reporting, including the Interim Financial Report (IFR), is newly established and is not yet familiar with project administration, the project payment verification process, and Bank requirements on financial reporting; and (b) a possible delay in Parliamentary approval of Sub Loan Agreement budgets could cause delays in availability of funds to PLN, and payments to contractors.
5. **Budgeting and Flow of Funds.** PLN's budget is prepared bottom up from decentralized units before being moderated centrally. Any major changes in the budgets need prior approval. Flow of funds may be affected by a possible delay in Parliament's annual approval of the Sub Loan Agreement budget, which could cause delays in availability of funds to PLN.
6. **Internal Control.** Based on the latest cost estimates, there will be up to four large contracts for goods and works with a total estimated cost of about US\$548 million. In addition, four consulting contracts will be financed by the Bank loan. For these contracts, the payments will be made through direct payments and special commitments..
7. Claims/invoices from vendors will be processed as follows:
 - a. The PIU situated in the field will verify progress/output against the contracts, prior to requesting payment processing by FD at PLN Head Office in Jakarta. For contracts of works and goods, supporting documents will include the certificate of work progress issued by the project engineer. For consulting contracts, supporting documents will include study reports, as appropriate.
 - b. The FD at PLN Head Office will review the payment requests and completeness of supporting documents, and compare them with the related contract summary. The FD will thereafter prepare the payment application and request the Finance Director's approval.
 - c. For projects implemented by State-Owned Entities (SOEs), such as PLN, the SOE submits the withdrawal application to the Directorate of Investment System and Management (*Direktorat Sistem dan Manajemen Investasi*) in MOF as a Budget user for payment verification, and then claims are submitted to the State Treasury Office (KPPN) as the authorized signatory. After verification by the Directorate of Investment System and Management, the withdrawal application will be processed for disbursement by KPPN (State Treasury Office) and submitted to the Bank for payment.
8. **Accounting and Reporting.** The project accounting system is not linked to PLN's head office computerized accounting system. PLN uses Excel spreadsheets to consolidate all accounts

for financial reporting purposes. This task is challenging, especially when eliminating inter office transactions and balances to reflect the consolidated financial position. To have better project information, loan expenditures and activities will be reported to the Bank on a quarterly basis through Interim Financial Reports (IFRs).

9. **External Audit.** Project financial statements under this loan shall be prepared by PLN. The auditors of PLN will provide information about the loan, use of funds and their opinion concerning the use of funds. A copy of the audited financial statements of the company, along with the auditor's opinion of the project expenditure, will be submitted to the Bank not later than six months after the end of each year.

10. The detailed financial management capacity assessment and arrangements are available in the project files.

Disbursement

11. The disbursement methods would be: (a) direct payment; (b) reimbursement method; and (c) special commitment, subject to the minimum amount per withdrawal application of US\$100,000, except the last withdrawal application. Any expenditures or invoices below the minimum amount need to be paid by PLN and consolidated for submission to the Bank for reimbursement when the amount reaches the minimum of US\$100,000 equivalent.

12. No withdrawal shall be made for payments made prior to the date of the Loan Agreement, except that withdrawals up to an aggregate amount not to exceed \$64,000,000 equivalent may be made for payments made for eligible expenditures prior to this date but on or after October 1, 2010.

13. Applications for requesting direct payment and reimbursement shall be supported by records evidencing such expenditures and evidence of payments made in case of reimbursements.

14. All documentation evidencing expenditures shall be retained by PLN and shall be made available to the auditors for audit, and to the Bank and its representatives, if requested.

Procurement

15. **Assessment of the Agency's Capacity to Implement Procurement.** The Department of Strategic Procurement in the headquarters of PLN will be responsible for coordination of procurement of the proposed project and the PIU in Bandung, West Java Province, will be responsible for implementation of the project. Procurement activities will be carried out by procurement committees.

16. An assessment of the capacity of the Implementing Agency identified the following key issues and risks concerning procurement as well as the mitigation measures:

Table A.3.1 Risks and Mitigations Measures

Risk	Mitigation
Conflicts between Bank Guidelines and PLN (and/or Government) Regulations.	A procurement manual has been prepared by PLN. It clarifies that procurement will follow the World Bank Procurement/Consulting Guidelines as specified in the Loan Agreement. The manual has been reviewed by the Bank and found to be acceptable. .
Complicated review procedures due to high value of contracts.	Detailed and realistic schedules of procurement activities have been prepared for monitoring and supervision. The PIP includes timeline for steps of procurement process. The project engineer to be selected for pre-construction engineering and construction supervision will provide assistance to ensure quality.
Uncertainty over capacities of procurement committee members and the PIU.	(1) Competent staff has been designated for procurement committees and PIU. (2) Training and experience sharing will be provided for the committee members. (3) The project engineer will be employed to assist the procurement committees.
Delay in selection of the project engineer.	Training and capacity strengthening will be provided to the committees. Working procedures and requirements have been clarified in the procurement manual. The shortlisted consultants have recently submitted their proposals.

17. Based on the above analysis, the risk of the project procurement is rated as “Substantial”.

18. **Applicable Guidelines and Thresholds.** Although Bank procurement guidelines were updated in January 2011, as project preparation started in late 2008, in agreement with PLN, it was decided that procurement for the proposed Project will be carried out in accordance with: the World Bank’s “Guidelines: Procurement under IBRD Loans and IDA Credits” dated May 2004, revised in October 2006 and May 2010; and “Guidelines: Selection and Employment of Consultants by World Bank Borrowers” dated May 2004, revised in October 2006 and May 2010; and the provisions stipulated in the Legal Agreement.

19. The following prior-review and procurement method thresholds will apply for procurement using loan funds:

Table A.3.2: Procurement Thresholds

	Prior Review Thresholds Proposed (USD million)	Procurement Method Thresholds Proposed (USD million)							
		ICB	NCB	Shopping	QCBS	QBS	CQS	Least Cost	SSS
Goods	0.5	≥1.0	<1.0	<0.05					
Works	5.0	≥10	<10	<0.05					
Consulting Services	0.1 for firm SSS: all				default	TBD	<0.2	TBD	TBD

20. **Procurement Plan.** PLN, at the appraisal, updated the procurement plan and the schedules of procurement activities for project implementation which provides the basis for the procurement methods and review requirements by the Bank. This plan has been reviewed and agreed with the Bank. It will be available on the website of the United Nations Development Business (UNDB) and on the Bank’s external website. The Procurement Plan will be updated in agreement with the Bank Project Team annually or as required to reflect the project implementation needs and improvements in institutional capacity.

21. The Procurement Plan is summarized in the tables below.

Table A.3.3. Procurement Plan -Goods, Works, and Non Consulting Services

	Project Title and scope	Est. Cost (US\$ Million)	Procurement Method	Pre-Qualification	Domestic Preference	World Bank Review	Exp. Bid Opening Date
IFB-1Lot 1	Upper and Lower Dam.	111.51	ICB	YES	NO	PRIOR	Feb 2012
IFB-1 Lot 2	Waterways, Underground Power House, Metal Works & Switchyard,.	151.59	ICB	YES	NO	PRIOR	Feb 2012
IFB-2	Electrical and Hydro mechanical Equipment & Building Works (complete)	271.36	ICB	YES	NO	PRIOR	Apr 2013
IFB-3	500 kV Transmission Line	13.52	ICB	YES	NO	PRIOR	Oct 2013

Table A.3.4. Procurement Plan – Consulting Services

Ref. No	Description of Assignment	Estimated Cost (USD'm)	Selection Method	Review by Bank (Prior/Post)	Expected Proposal Submission Date	Comments
1	PRP and ESP	2.0	Individual	Prior	Oct. 2010	Retroactive Financing – consists of several individuals
2	Engineering Consulting Services including supervision of access road.	25.0	QCBS	Prior	Mar. 2011	Retroactive financing
3	Feasibility Study, Basic Design, and Bid Document for Matenggeng Pumped Storage Power Project.	9.3	QCBS	Prior	Sept. 2012	
4	Environment Impact Assessment for Matenggeng Pumped Storage Power Project.	0.4	QCBS	Prior	Nov. 2012	
5	Resettlement Action Plan	0.3	QCBS	Prior	Nov. 2012	

22. As indicated in the above table, the selection of Project Review Panel and consultant for Engineering Consulting services will be under retro-active financing.

23. **Frequency of Procurement Supervision.** In addition to the prior reviews by the Bank team of all the major procurement activities as described in the procurement plan, the capacity assessment of the Implementing Agency has recommended one supervision mission to visit the field on average every 6-months for the first two years of the project implementation. The frequency of procurement supervision (including special procurement supervision for post-review/audits) will be further defined after the first two years.

Environmental and Social Safeguards (See Annexes 7 and 8).

Governance and Accountability Framework (GAF)

24. A guideline on Good Corporate Governance is in place in PLN, incorporating an Enterprise Risk Management (ERM) system. Operational since 2007, PLN's internal procedures mandate that all major activities should be subject to a review by the Risk Management Division under the Director of Business and Risk Management. Risks evaluated include those associated with the delivery of project objectives, reputational risks, social and environmental risks, and risks of fraud and corruption. Risk criteria have been established, and risk ratings are determined based on likelihood and impact, and mitigation measures are proposed. The risk assessment is considered by a designated Committee of Directors and mitigation measures approved. PLN's own internal risk assessment and proposed mitigation for the Upper Cisokan Pumped Storage Hydro-Electrical Power (1,040 MW) Project will complement actions outlined in the GAF, as agreed with PLN.

25. The following provides a summary of the GAF action plan (the full GAF is available in project files):

- **Enhanced Disclosure Provisions and Transparency.** The project will make use of the website and other communication channels (notice boards at the project website, press releases and/or conferences, public meetings) to disclose information regarding the project. All forms of communication will also display channels available to the public to make inquiries and to file complaints. Contractors will be required to take pictures of activities and/or physical progress as part of their report, to be uploaded in PLN's website at regular intervals. The risk of corrupt practices arising from land acquisition and resettlement will be addressed separately through transparent consultation and deliberation processes as defined in the LARAPs approved by the Bank.
- **Civil Society Participation in Oversight.** The Enhanced Disclosure Provisions and Transparency component of the Action Plan will serve as a catalyst to bring the project closer to its internal and external stakeholders. Enhanced participation will also be achieved through intensive communication with local government, and the public will be invited to oversee the project - at least virtually through the project website.
- **Complaints Handling Mechanism.** A complaints handling mechanism will be established and integrated with the existing mechanism at PLN. Apart from the existing customer service phone and web hotlines, PLN should make other channels (such as mail and email addresses, text message numbers) available for the public to file complaints. The available channels will be displayed in the project's communication materials such as bid documents, public notices at the project site, and PLN's website (www.pln.co.id). Complaints will be acted upon in a professional and timely fashion, and without risk of reprisal to 'whistleblowers', by maintaining confidentiality of the sources of information. Complaints and follow up actions will be presented as part of the project report.
- **Sanctions & Remedies.** In all procurement contracts, evidence of corruption, collusion or nepotism will result in termination of the relevant contract, possibly with additional penalties imposed (such as fines, blacklisting, etc.) and in accordance with Bank and Government regulations. In addition, requirements in the contract will enable PLN to terminate contractors for poor performance as stipulated in the contracts.

- **Mitigating Collusion, Fraud & Nepotism.** PLN will make use of its ‘semi’ e-procurement system in its official website (<http://eproc.pln.co.id>) to disclose procurement related information. It will also maintain fairness and transparency in procurement processes by managing complaints effectively, and enforcing sanctions appropriately and consistently if there are proven cases of collusive and corrupt practices.
- **Audit.** An independent audit of PLN will be conducted and will include a paragraph explaining the loan, the status of funds used, and the auditor’s opinion on the use of funds.

Monitoring and Evaluation

26. The outcome indicators will be monitored by the PIU, the IMET for land acquisition and resettlement, and the Bank project team, especially at mid-term review and completion. Project construction progress will be closely monitored by the PIU in Bandung. During the early stages of the project implementation, progress monitoring will focus on progress of procurement activities against the agreed procurement plan, implementation of the agreed LARAPs and EMP, and construction progress of the new access road and other preparatory works. Starting from 2012 monitoring will focus on progress of the main works. From 2015, the focus will be on the commissioning of the project.

27. With the assistance of the Project Engineer and the IMET, the PIU will compile data and monitor project implementation progress monthly. Semi-annual project progress reports will be prepared for the Bank and PLN’s management to review and evaluate project implementation. During regular supervision missions, the Bank team will work closely with the project coordinator of the PMU and the PIU to evaluate implementation progress. The cost of data collection, monitoring and evaluation will be covered by the administrative budget of the PIU and the PMU.

Annex 4: Operational Risk Assessment Framework (ORAF)

INDONESIA: UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW) PROJECT

Project Development Objective(s)

Description: The development objective is to significantly increase the peaking capacity of the power generation system in Java-Bali in an environmentally and socially sustainable way and strengthen PLN's institutional capacity in hydropower planning, development and operation.

PDO Level Results Indicators:	1. increased the peaking capacity of Java-Bali power system
	2. the percentage of PAHs that have achieved increased/restored incomes or assets
	3. the evidence of satisfactory compliance with the EMP
	4. improved capacity of PLN in planning, development and operation of pump storage power projects according to international practice

Risk Category	Risk Rating	Risk Description	Proposed Mitigation Measures
Project Stakeholder Risks	Medium-I	<p>Perceived negative environmental impacts of large hydropower projects by some national and international NGOs, as well as other stakeholders.</p> <p>Some government agencies (both at national and local level) may perceive that the social risk (relating to land acquisition and resettlement) is too high to manage, therefore may not take pro-active steps to implement the agreed land acquisition and resettlement plans.</p>	<p>A detailed media analysis (from 2006 to 2010) has been conducted and it concludes that stakeholder perception on negative environmental impacts has not been an issue during project preparation.</p> <p>Considerable coordination and information dissemination have taken place during project preparation to increase awareness of the proposed project. Public consultation and information dissemination will be conducted during project implementation.</p> <p>The GoI has included this project as part of its second "Fast-Track" program to increase power generation capacity from renewable energy and government agencies have been facilitating discussions amongst various stakeholders and themselves.</p> <p>Consultations during the preparation of the environmental and social documentation of the project indicate strong support from the population in project areas.</p> <p>Although the majority of stakeholder risks are mitigated during project preparation, the project team will carefully monitor for any unforeseen issues that may arise during project implementation.</p> <p>A Communication strategy has been developed.</p>

Risk Category	Risk Rating	Risk Description	Proposed Mitigation Measures
<p>Implementing Agency Risks</p>	<p>High</p>	<p>The PIU is newly established and is not yet familiar with project administration, project payment verification process and Bank requirements on financial reporting.</p> <p>A possible delay in Parliamentary approval of Sub Loan Agreement budgets could cause delays in availability of funds to PLN and delay payments to contractors.</p> <p>Complicated review procedures due to high value of contracts.</p> <p>Delay in selection of the project engineer.</p> <p>PLN has not developed any large hydropower projects for over two decades. The capacity to implement such projects has been significantly weakened.</p> <p>The PIU could face institutional and governance issues if it does not develop or learn to deal with various decision makers. In addition, a risk adverse attitude may also slow down the decision making processes.</p> <p>Cases of corruption have not been noted in PLN for the Bank financed projects during the past few years. However, corruption is a general concern for infrastructure project implementation in Indonesia</p>	<p>Training has been, and will continue to be, provided to PIU staff.</p> <p>PLN has decided to prepare the project budget plan earlier to give enough time for the parliament to review and approve the budget.</p> <p>Detailed realistic schedules of procurement activities have been prepared for monitoring and supervision. The Project Implementation Plan (PIP) includes timeline for steps of procurement process. The project engineer to be selected for pre-construction engineering and construction supervision will provide assistance to ensure quality. Training will be provided to the committees. Working procedures and requirements have been clarified in the Procurement Manual.</p> <p>Key managers appointed in the PIU have hydropower development experience. A qualified international engineering firm will be selected as the project engineer to assist PLN in supervising the project implementation.</p> <p>In addition to the existing coordination mechanisms within PLN, the operation procedures, and roles and responsibilities of the PIU have been established.</p> <p>The Bank team will closely monitor the progress of the project implementation to make sure that major decisions will be made within a reasonable time frame.</p> <p>A governance and accountability framework of the project has been developed and agreed with PLN for implementation.</p>

Risk Category	Risk Rating	Risk Description	Proposed Mitigation Measures
Project Risks			
Design	Medium-I	The detailed engineering design was carried out in the early 2000s and needs to be updated and optimized to better consider the seismic risks and reduce costs.	<p>A qualified international engineering consultant will be selected to conduct pre-construction engineering review and design and construction supervision. Review and updating of the design will be a task of the selected consultant.</p> <p>The final design will be reviewed and agreed by the PRP and the Bank.</p>
Social & Environmental	High	The project is considered EA Category A due to the severity, scale and irreversibility of potential social and environment impacts of the project mainly including: (a) large scale land acquisition and household relocations; (b) the slow process of issuing the location determination by related authorities; (c) the fact that some resettlement activities have already taken place along the rehabilitated existing access road as part of the project preparatory works; (d) downstream environmental impacts; (e) dam safety and reservoir security; and (f) indirect negative impacts on a one ha. remnant of secondary growth forest along the Cirumamis River, at the margin (outside) of the lower reservoir, where three endangered species were noticed during field surveys.	<p>Social risks are managed by LARAPs and adequate capacity to implement them has been demonstrated during the project appraisal. Functioning grievance redress processes, and independent monitoring of compensation, relocation and rehabilitation assistance, as well as livelihood restoration outcomes for those affected, will ensure that social impacts are adequately managed.</p> <p>PLN and related government agencies are working closely for the location determination. Issuing the location determination is a condition of loan effectiveness.</p> <p>A completion report received from PLN for the existing access road LARAP implementation records the actual impacts and concluded that PAPs' livelihoods were not affected. This will be verified by independent evaluation, But if any loss of livelihoods has occurred, PLN agrees that it will be addressed in a manner consistent with the LARAP.</p> <p>The environmental impacts of the project have been carefully evaluated, mitigation measures were designed to address all issues related to the project, and budget has been allocated for implementation of these measures.</p> <p>PLN has obtained ISO 14001 Environmental Management System certification and has an established environmental management system.</p> <p>A qualified international engineering consultant will be selected to assist PLN to implement the EMP.</p> <p>An independent ESP has been established to review and provide guidance to PLN on the implementation of EMPs and LARAPs.</p> <p>The Bank team will provide extensive and strong implementation support to PLN.</p>

Risk Category	Risk Rating	Risk Description	Proposed Mitigation Measures
Program and Donor		No specific risk identified.	
Delivery Quality	Medium-L	Possible implementation delays due to slow procurement of large contracts, or technical challenges not foreseen by PLN or the contractors.	<p>Number of contracts are limited to reduce the burden on PLN for procurement management.</p> <p>A qualified international engineering consultant will be recruited to assist PLN with procurement;</p> <p>Technical risks, including seismic risks will be further evaluated and mitigation measures will be developed during the pre-construction engineering stage.</p>

Overall Risk Rating: Preparation	Overall Risk Rating: Implementation	Comments
High	High	The proposed project will be the first pumped storage and the largest hydropower generation facility (in terms of installed capacity) in Indonesia. Though PLN is an established power utility which has successfully implemented many Bank projects (including large hydropower power projects), in the past, it has not developed any large hydropower projects for around two decades. The overall implementation risk is rated high mostly because of the high social risks relating to the large number of project affected people and weak capacity of the implementation agency in developing large hydropower projects. In addition, other risks are identified in the areas of stakeholder perception, sector pricing policy, and project risks. However, appropriate mitigation measures are in place to address all the risks identified which will be monitored throughout implementation.

Medium-L: High Likelihood – Low Impact
Medium-I: Low Likelihood – High Impact

Annex 5: Implementation Support Plan¹³

INDONESIA: UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW) PROJECT

1. The strategy for implementation support (IS) has been developed based on the nature of the project and its risk profile. It aims to make implementation support to the client more flexible and efficient, and will focus on implementation of the risk mitigation measures defined in the ORAF. Given the large size, complexity and high risk profile of the project, resources required for IS are much larger than those required for Bank supervision of projects with lower risk rating.

2. The key focus of the implementation support will be on:

- Implementation of the land acquisition and resettlement plan, the livelihood restoration programs and other measures to mitigate social risks.
- The implementation of the environmental management plan to ensure that: (a) mitigation measures developed are implemented properly; (b) sub-plans are developed according to the guidelines and terms of reference documented in the EMP and implemented satisfactorily; (c) safeguards screening for the forest replacement lands is properly conducted, and environmental and social impacts, if any, are properly addressed in accordance with the Bank policies; (d) the forest replacement land is provided in accordance with the requirements of the Ministry of Forestry.
- Reviewing reports and other outputs of the project engineer, including the updated design and technical specification, to ensure that the seismic and other technical risks are properly mitigated, and the design is updated and optimized.
- Assistance to PLN in monitoring the project implementation schedule and coordination among project engineer, the PRP, contractors and suppliers to further mitigate technical risks.
- Ensuring that the capacity building activities embedded in different components of the project are well coordinated.
- Timely procurement support to PLN in preparing and reviewing bidding documents and resolving issues arising during the procurement process.
- Communication to ensure that adequate and effective project communications are conducted on a regular basis.

¹³ This is an indicative and flexible instrument which will be revisited during implementation as part of the ISR and adjusted based on what is happening on the ground. The implementation plan should be consistent with the design and riskiness of the operation, and should be adequately resourced.

Implementation Support Plan

Safeguards and Communication

3. Implementation support will be provided at two levels. On the first level, the Bank will help support project implementation monitoring by the independent resettlement monitoring agency (for the LARAPs) and the project engineer (for the EMP). Bank will also evaluate the quality of any additional safeguards documents to be produced, review the reports produced by the independent monitoring agency, the supervision engineer and the ESP, on resettlement/land acquisition, health and safety, and EMP implementation.

4. On the second level, the Bank team will review results on the ground. Safeguards specialists will join supervision missions and will schedule site visits during missions so that each facilities' footprint is visited no less than twice a year. Facilities at which there are most affected people or major concerns will be visited more frequently in the first two years of implementation.

5. In addition to normal semi-annual missions, during critical periods of construction, intensive supervision missions would be undertaken. Support will also be provided to PLN for working/training sessions to be conducted prior to the start of some critical project activities, such as commencing legal surveys, compensation payments, replacement housing construction, livelihood restoration activity finalization, and relocation. Lastly, the team will hold participatory audits of monitoring reports, once they begin to be produced, hold fire drills of grievance redress procedures and bring experienced staff from similar Asian resettlement projects to share experience and help PLN solve implementation problems.

6. The following is proposed to ensure more effective implementation and monitoring of outputs and results.

- Continuous engagement through country based safeguards staff.
- Building on experience and learning from other large value, complex infrastructure projects in terms of risk assessment and mitigation, anticipation and proactive attention to risk issues, particularly on safeguards. Developing strong relationships with PLN implementation teams, mutual learning and capacity building initiatives/events, and joint supervision of project activities, including interactions with stakeholders.
- Maintain proactive communications and consultations with project stakeholders and civil society through round-table discussions and other informal meetings.

Technical

7. The Task team will work closely with PLN, the project engineer and the PRP to ensure that (a) the design and the construction of the dams, the waterway structures and other ancillaries meet industry and international standards, and (b) all equipment procured are of good quality.

8. The hydropower engineer will review and provide inputs to the updated design, technical specifications and project management. The hydropower engineer will participate in major project supervision and field visits during the construction stage to monitor and inspect the works performed under the major contracts. The hydropower engineer and electrical engineer will also be responsible for technical review of bid documents and evaluation reports, and for providing technical inputs to the team's procurement specialist.

Fiduciary requirements and inputs

9. Procurement implementation support will include: (a) providing training to members of the Procurement Committees and related staff in the PIU, as well as the Project Engineer; (b) reviewing procurement documents and providing timely feedback to the Procurement Committees; and (c) providing detailed guidance on the Bank's Procurement Guidelines to the Procurement Committees; and (d) monitoring procurement progresses against the Procurement Plan.

10. Financial management supervision will review the project's financial management system, including but not limited to, accounting, reporting and internal controls. The Bank team will also work with the project supervision engineer to assist PLN in improving coordination among different departments and units for financial management and reporting. Finally, if necessary, the Bank will coordinate with other related international development financial institutions to work with the government and other stakeholders to ensure that parliament approval of the government budget will not delay the disbursement of the Bank loan.

11. Training will be provided by the Bank's financial management specialist and procurement specialist before the commencement of project implementation. The team will also help PLN identify capacity building needs to strengthen its financial management capacity and to improve procurement management efficiency. Both the financial management and the procurement specialists are based in the country office to provide timely support. Formal supervision of financial management and procurement will be carried out semi-annually, while procurement supports will be provided on a timely basis as required by the client.

Financial review of PLN corporate finance

12. Input is required from a financial specialist for regular review of PLN's financial status to verify compliance of financial covenants. This exercise will be combined with the supervision of other WB financed projects implemented by PLN through semi-annual review.

Operation

13. An operations officer, based in the country office will provide day to day supervision of all operational aspects, as well as coordination with the client and among Bank team members.

Team and Resources Requirements

14. Over half of the task team members will be based in the country office to ensure timely, efficient and effective implementation support to the client: are procurement specialist;

financial management specialist; environmental specialist; social development specialist; and energy specialist. The rest, including the hydropower engineer, dam specialist, social development specialist and environmental specialist, etc. are expected to be highly experienced internationally based staff and/or consultants who were key team members for project preparation. Task team leadership, if feasible, will also be transferred to the country office in the second year of project implementation. For positions where there are one country based and one international based team member, the country based team member will be responsible for day to day supervision and implementation support; the internationally based team member will provide strategic guidance and quality assurance.

15. Staff skill mix required is summarized below.

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Task team leader	6 SWs first year, then 4 SWs annually in the following years	Two/year	Internationally based the first year, country based starting from the second year
Hydropower engineer	4 SWs the first year, then 3 SWs annually	Two/year	Internationally based
Social specialist (internationally based)	5 SWs the first year, then 4 SWs annually	Two/year	Internationally based
Social specialist (country based)	8 SWs the first year, then 6 SWs annually	Six /year	Country based
Environment specialist (Internationally based)	3 SWs the first year, then 2 SWs annually	One/year	Internationally based
Environmental specialist (country based)	6 SWs the first year, then 5 SWs annually	Six/year	Country based
Financial management specialist	2 SWs annually	As required	Country based
Procurement Specialist	6 SWs the first two years, then 2 SWs annually	As required	Country based
Operation Officer	6 SWs annually	Six/year	Country based
Sector financial analyst	1 SWs annually	One	Internationally based
Communication Officer	2 SWs annually	As required	Country based

Annex 6: Team Composition

INDONESIA: UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW) PROJECT

World Bank staff and consultants who worked on the project:

Name	Title	Unit
Leiping Wang	Task Team Leader, Senior Energy Specialist	EASIN
Barry Trembath	Lead Hydropower Engineer/Consultant	EASIS
Melinda Good	Senior Counsel	LEGES
Warren Waters	Lead Social Dev. Specialist/Consultant	EASIS
Lis Nainggolan	Senior Social Dev. Specialist/Consultant	EASIS
Juan D. Quintero	Lead Environmental Specialist/Consultant	EASER
Andrew Daniel Sembel	Environmental Specialist	EASIS
Puguh Imanto	Energy Specialist	EASIS
Anh Nguyet Pham	Senior Energy Specialist	EASVS
Dhruva Sahai	Senior Financial Analyst	EASIN
Rajat Narula	Senior Financial Management Specialist	EAPFM
Christina I. Donna	Financial Management Analyst	EAPFM
Zhentu Liu	Sr. Procurement Specialist	EAPCO
Budi Permana	Procurement Specialist	EAPCO
Dayu Nirma Amurwanti	Operations Analyst	ENCIF
Zijun Li	Carbon Finance Specialist	ENVCF
Allison Bridges	Consultant	EASIS
Sri Oktorini	Program Assistant	EACIF
Teri Velilla	Program Assistant	EASIN

Annex 7: Social Safeguards

INDONESIA: UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW) PROJECT

1. The Upper Cisokan Pumped Storage Project consists of three major sub-project components: (a) construction of the access road and quarry; (b) construction of the upper and lower reservoirs (including their upper and lower dams, green belts, spoil banks, the surge tank, the outdoor switchyard and resettlement sites); and (c) construction of 500 KV transmission towers and the right of way (ROW) of the transmission lines. Physical construction of these projects requires land acquisition that will impact people's lives by decreasing land assets and requiring relocation of residents. Three LARAPs have been developed to address these impacts.

Project Impact Identification

2. Project social impacts are expected from:

- Operations within the rock quarry (already acquired in 1982-87 for the Saguling Hydropower project owned by PLN).
- Road widening for ditches (from 8 m to 14 m) and re-paving 6.7 kms of the existing road along the ROW (already acquired in 1982-87 for the Saguling Hydropower Project).
- New acquisition of 27.54 ha of private land (and 40 ha forest land) to build 27.3 km of new access road in Cipongkor and Rongga sub-districts of West Bandung Regency, linking the existing road with the two dam sites.
- Acquisition of 363.46 ha (including 77 ha of forest land) for building the upper dam on the Cirumamis river, the lower dam at the junction of the Cisokan and Cilengkong rivers, and their reservoirs (including a switchyard near the lower dam and each reservoir's respective slide hazard areas, disposal areas, and green belts).
- Height restrictions on trees and structures within a 34m wide ROW along 29.5 km for a double circuit 500 kV transmission line, and 11.98 ha land acquisition for its 82 tower pads.

3. The following types of impacts have been identified:

- Land acquisition and household relocation.
- Business and job losses.
- Impacts on public infrastructure and cultural resources, such as mosques and graves.
- Public health impacts.
- Gender impacts.
- Loss of easy connections to neighborhoods, relatives, etc.
- Impacts on social facilities, such as schools, sports yards (play grounds).

4. Tables A.7.1 and A.7.2. summarize the land acquisition and population affected.

Table A.7.1: Land Acquisition for Upper Cisokan Project

Components	Land Acquisition (in ha) by District			Project Affected People		
	West Bandung	Cianjur	Total	Household	Families	People
Access Road & Quarry– acquisition ¹⁴	27.54		27.54	425	454	2002
Reservoir and Dam Work – acquisition	243.11	120.3	363.46	996	1025	3321
T-line tower pads– acquisition	0.31	11.67	11.98	60	67	229
Resettlement sites - acquisition	80	5.7	85.7	4		
Subtotal – Private Acquisition ¹⁵	350.96	137.67	488.68	1485	1546	5552
Estimated added Forest Land – Acquisition ¹⁶			227.52			
TOTAL ACQUISITION			716.2	1485	1546	5552
T-line ROW– height restrictions			50.89	286	334	1054
PLN land along existing road and quarry			65.43	434	455	1607
TOTAL IMPACTS			832.52	2205	2335	8213

Table A.7.2: Summary of Population Affected

Types of losses ¹⁷	Affected households (AHs)				Affected Persons (APs)			
	Access ¹⁸	Reservoir	T-Line	Total	Access ³	Reservoir	T-Line	Total
Agricultural land	859	996	346	2201	3609	3321	1283	8213
Structures (includes housing, business and other structures)	259	1035	56	1350	574	2105	123	2802
Indirect impacts (wage earners and sharecroppers)	623	418	168	1209	1607	1032	605	3244
Total Displaced	141	583	9	733	574	3321	33	3928
Public Infrastructure	5 mosque 1 cemetery 5 bridges 1 spring water 1 water & sanitation	7 mosque 28 mushala 6 schools 686 graves 3 bridges 10 w&s	1 mosque 63 graves					

¹⁴ Land to be acquired does not include 65 ha of land already owned by PLN at the existing quarry and existing road. Impacts on existing and new access roads are estimated based on 20m RoW width, but is subject to revision based on site and slope conditions.

¹⁵ Estimates of forest land acquisition were done by PT. Perhutani, separately and independently of the census of affected people and inventory of their assets. PT. Perhutani estimates forest land acquisition of 382 ha, only 154.48 ha of which is included in the first three rows of Table A.7.1. LARAP census only measured land used or claimed by affected people, or land recognized by PAPs as forest land, therefore only the occupied portions of this forest land was covered by the resettlement census and inventory of assets. The portion of the forest land unoccupied must also be acquired, but State and Forest land encroachments require a legal survey to clarify ownership, which will be done during implementation.

¹⁶ This row is the estimated forest land unused by PAPs. Total Forest land to acquire was estimated independently by PT Perhutani (at 382ha) but includes approximately 154.48 ha of land already counted in the LARAPs as used or occupied by households. To avoid double counting, this row of Table A.7.1 therefore only adds the incremental forestry land to be acquired.

¹⁷ Includes all impacts including land acquisition, height restrictions, physical displacement as well as those only losing a portion of land or structures. Impacts on existing and new access road RoW width are estimated based on 20m but is subject to revision based on site and slope conditions.

5. Beyond resettlement, the project is expected to have several other social impacts as well. PLN encourages local hiring by contractors where skills are available, and up to 1,500 workers are needed at the peak of construction activity, 60 percent of whom may be unskilled. Common construction-related issues such as noise, traffic hazards, dust, and disturbances and health issues from workers are anticipated, however the local population will also benefit from jobs and a demand in local enterprise / services. There will be a large group of service providers attracted to the project areas as well. The influx of population will increase public health risks, HIV and STD diseases in particular, to both construction workers and the local population. The relocating households would also be vulnerable to health impacts during the relocation process. If a decline in a food species or a substantial change in indigenous fish communities is identified during operations monitoring, mitigation measures will be explored, such as the introduction of other food species, or capture and release of species up and downstream of the dams.

6. Impacts unrelated to land acquisition are identified and mitigation activities planned in the following management plans:

- (a) Physical Cultural Resources Management Plan has already been drafted and documents the physical cultural resources, private graves and religious buildings in the project area, specifying methods and responsibilities to protect resources during construction.
- (b) Social and Community Relations Plan - must be in place at least six months prior to the start of the resettlement process and / or construction, whichever is sooner, and include cultural and environmental awareness, health programs, community procedures for communications, grievance processes, changes to connectivity, and risks around reservoir filling, blasting and other construction-related impacts, and a Traffic Management Plan.
- (c) Biodiversity Management Plan has already been drafted, outlining an adaptive management plan and a monitoring process to protect and enhance the forest community (both the habitat and its inhabitants) and protect and restore the reservoir greenbelts to provide additional habitat for indigenous fisheries and wildlife.

7. Women are more vulnerable to some types of impacts, therefore a draft gender strategy has been prepared and included in the LARAP annexes, to ensure both genders participate fully in consultation and negotiations, have access to grievance redress, and share the benefits of employment and replacement assets. Spouses will countersign documents at the time of replacement asset purchase and when receiving cash compensation. The project will also provide support to women to ensure their access to training, affordable credit and business development services. In monitoring rehabilitation and income restoration, existing women's groups will be used to collect data and encourage participation of all affected people.

Resettlement Policy

8. The project triggers OP4.12 Involuntary Resettlement, and project plans have been developed to address project impacts in compliance with both GOI and World Banks' relevant policies.

9. All affected households and persons residing in project affected areas before the eligibility cut-off date are eligible for compensation and assistance to be provided by the project. The cutoff date for both title holders and non-title holders is defined as the date of announcement of the location determination by the West Java Province Governor. The eligibility will be determined by the project inventory results announcement and after any grievances about the inventory results announcement have been resolved by the Project Land Acquisition Committee. The Project Entitlement Matrix covers all types of direct, indirect, customary rights of occupancy and titles, verifying the inventory of losses established during the inventory survey (this inventory will be confirmed by the P2T Land Acquisition Committee during implementation). The full details of the entitlement matrix are available in the LARAP.

Land Acquisition and Resettlement Action Plans (LARAP)

10. Project preparation has included public input throughout the project's design. Planning activities also included 100 percent census impact assessment and inventory, 20 percent sample socioeconomic surveys, vulnerability and gender assessment. The planning involved local information sharing and consultation with local communities through focus group meetings and workshops during the impact identification and drafting of compensation and resettlement policies. These meetings covered compensation issues, the options for relocation and resettlement, and approaches for livelihood development.

11. These studies have been incorporated into three Land Acquisition and Resettlement Action Plans (LARAP) now drafted, the first covering the access road and quarry, another covering the two dams and their reservoir areas, associated switch-yard, slide hazard and green belt areas, and a third LARAP for the transmission line and tower pads. The LARAPs detail the socio-economics of the project areas, resettlement planning activities, project impacts, entitlement policies and packages, resettlement and rehabilitation approaches, implementation arrangements, institutional, monitoring and grievance redress mechanisms, cost and financing arrangements. Land acquisition and payment of compensation for affected assets will be managed by specially appointed Land Acquisition Committees for West Java Province and each District (P2T), under Presidential Decrees No. 36 of 2005 and No. 65 of 2006, and BPN Regulation No. 3 of 2007.

12. While the LARAPs were being prepared, PLN undertook civil works requiring some minor resettlement along the existing road. The land affected is owned by PLN, and occupied under agreements between PLN and occupants, witnessed by local village government.¹⁹ Under the terms of those agreements, 83 existing road ROW occupants were given notice in July 2010 and assisted to relocate any structures affected by the drainage ditches constructed in August.

13. In all, 87 structures were affected, but none were displaced. All PAPs were able to shift back in the remaining land, also owned by PLN. Structures affected included 12 kiosks, 68 residential walls or fences, five security 'monkey' huts, and two market stalls. Although not required under the occupancy agreements, 'compassionate' disturbance assistance totaling 4

¹⁹ The actual agreements state: "...I am requesting that I may be permitted temporarily to occupy the land owned by PT. Indonesia Power, and I declare that this land that I am occupying is truthfully the property of PT Indonesia Power of Saguling Generation Business Unit and I hereby undertake: 1. To return the land being occupied by me without demanding compensation from PT Indonesia Power at anytime the land should be used by PT. Indonesia Power of Saguling Generation Business Unit..."

million Rupiah was paid by the civil works contractors to affected people, and payments were witnessed by sub-district government RW officials to ensure only legitimate PAPs were paid. Small bridges to ensure access across the ditch were built by both PAPs and sub-contractor laborers, with material provided by the contractor. During the implementation of the project, PLN will document income of those affected to assess whether any loss of livelihood occurs. It is expected that losses are so minor that they will not affect anyone's earning ability. If loss of livelihood does unexpectedly occur, measures to correct it will be designed based on the agreed LARAP.

Relocation Sites

14. Owners of affected buildings or land can choose to receive cash compensation, relocation/ resettlement or other options. Other options include ready to build lots, land exchanges with same size and productivity, simple houses, developers built housing with credit facilities or other schemes. Any group of 30 or more households may select their own sites, and PLN will construct necessary public infrastructure. Those who choose land for land compensation will get a piece of land/building where they do not have to pay more than the compensation received for the previous asset. The principle applies that sites must be feasible for improving, or at least maintaining the livelihood of PAPs at the same condition as before the project.

15. Of the 733 households to be relocated, only 15.4 percent (113 households) have expressed interest in PLN providing resettlement sites, the remaining prefer to relocate themselves (82.7 percent) or have not decided (1.9 percent). To accommodate those few households interested in PLN providing relocation sites, only about 10 to 15 ha could be required for those sites, depending on site characteristics and public infrastructure needs. Land acquisition will follow the same approach and offer the same entitlements as the main project, including participation of the host site existing residents in planning and relocation. Three group resettlement sites within 10 km of the planned reservoirs have already been recommended in a pre-feasibility study. These three were selected out of nine sites considered in a pre-feasibility study, based on their potential for income restoration, slope stability and geology for buildings, water availability, and free space (none will require further displacement of any homes or structures). The sites must be confirmed by local government and PAPs. The environmental impacts of developing the relocation sites are being assessed in a feasibility and design study now underway.

Institutional and Implementation Arrangements

16. **Land Acquisition Committee (LAC).** The LAC at the Province Level will provide guidance for the implementation of land acquisition in districts: coordinate and integrate the implementation; provide consultation to the Governor in the decision-making of the form and/or amount of settlement proposed by the Regents; and carry out supervision and control the implementation of land acquisition in the Districts. LACs at Cianjur and West Bandung Districts will provide information dissemination to the affected community; conduct review and verification of the list of PAPs and inventory of affected land and other assets; announce the result of PAPs and the inventory; hire an independent licensed appraiser (to be paid by PLN); receive appraisal results from an independent appraiser for affected land or from the officials in

charge of the appraisal of the building and/or plants and other objects pertaining to lands; facilitate deliberations between the owners and PLN in order to determine the form and amount of compensation; establish the amount of compensation, witness the payment of compensation to eligible affected people, prepare the official report on land release and submit them to PLN.

Information, Consultation, Participation and Communication

17. Stakeholders include those affected directly or indirectly, as well as the local governments and goods and service suppliers, contractors, customers and suppliers of PLN. For those directly affected by land acquisition and resettlement, in addition to individual household census and sample survey respondents, Focus Group Discussions and public consultations were conducted for LARAP preparation; details are available in the LARAPs. Consultations will continue during implementation, and the LARAPs include specific provisions and requirements for further consultations to manage impacts and income restoration.

Grievance Redress Mechanism

18. Grievance redress and dispute resolution will be provided through an independent Task Force of community development specialists to be appointed by PLN to address complaints from affected people. The procedure will not replace the existing legal process but will seek to resolve the issues and help expedite the receipt of compensation, without resorting to expensive and time-consuming legal actions. The LARAPs describe in detail the Task Force composition, complaint filing procedures, operating principles and procedures, and timetable for grievance redress. A register will be maintained to register queries, suggestions and grievances of the PAPs. All queries, suggestions and grievances recorded will be forwarded to the Task Force and its functioning will be monitored monthly by PLN.

Monitoring and Evaluation

19. Monitoring and evaluation of the implementation of LARAP will be conducted by an Independent Monitoring and Evaluation Team (IMET). Monitoring requires monthly, quarterly and annual assessment to ascertain the progress of LARAP implementation and to provide feedback, if necessary, to keep the plan on schedule and maintain the quality of results. The LARAP provides indicators to be monitored and evaluated. These include: physical assets acquired (land, structure, etc.); number of affected people receiving compensation and/or assistance; area and quality of replacement land and structures; grievance resolution effectiveness; utilization of compensation; number of business re-established; and income of affected people after being moved.

Cost and Financing

20. The total cost of the resettlement is estimated at Rp. 669,570 million (US\$74.4 million equivalent). PLN will finance all resettlement costs. The key cost categories are compensation for lost personal and public property; allowances for resettlement and relocation; site development; rehabilitation and livelihood improvement assistance; and the contractors and consultants costs needed to facilitate management, monitoring and grievance redress. Site development cost estimates are being defined by ongoing site feasibility and design study. Total costs include a 5 percent (3 percent for physical, and 2 percent for price) contingency.

Annex 8: Environmental Safeguards

INDONESIA: UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW) PROJECT

Introduction

1. A series of environmental, social and design studies have been carried out since preliminary investigations began in the early 1990's²⁰. A consolidated Environmental Impact Assessment (EIA) updates and synthesizes relevant information from all the previous EIA and Social Impact Assessment (SIA) reports. To complete this consolidated EIA, two separate studies were carried out in 2009 to update the physical culture resources and the biodiversity surveys, and look into the project impacts on the connectivity conditions in the project areas. In addition, numerous technical and design studies have been carried out to determine the feasibility and the detailed design of the hydropower scheme. The key features of these technical documents have also been reflected in the consolidated EIA.

2. The Access Road Construction EMP is being implemented in a concurrent process to the EIA process. As the access road is the first construction contract that has been let, the management plan has been prepared separate and prior to the EMP that forms part of this consolidated EIA process. The Access Road Construction EMP documents all of the potential environmental and social risks and impacts along the proposed route and mitigation measures that should be implemented by PLN and the contractor.

3. The terms of references for development of the draft EIA (including the environmental management plan (EMP)) and previous versions of major EIA and EMP were the formal subject of public consultations, and meetings with related government institutions and other stakeholders by PLN. Public consultations were also conducted from late the 1990s to 2007 for all the major EA documents produced before 2007, and in 2010 and early 2011 for the consolidated EIA and EMP. Both documents were disclosed via World Bank's website (English version), and PLN's website (Bahasa version) in mid October 2010. The announcement of disclosure of EIA and EMP was also published in local newspapers on November 29th 2010. The documents have been available for public review at the PLN Bandung Office and the PLN Site Project Office since November 2010. Public consultations have been carried out with the local government, NGOs, academics, media, project affected people and local parliament members through formal meetings and focus group discussions, and with the general public through several exhibitions.

²⁰ (i) the Environmental Impact Analysis of Upper Cisokan (Pumped Storage) HEPP West Java in 1998; (ii) the Additional Environmental Investigation for the Detailed Design of Upper Cisokan Pumped Storage Hydroelectric Power Plant Project, in 2001; (iii) the Upper Cisokan Hydroelectric Power Plant Project Additional Environmental Investigation - Social Acceptability Assessment in 2001; (iv) the Environmental Impact Assessment - Upper Cisokan Pumped Storage (UCPS) Bandung Regency and Cianjur Regency West Java Province in 2007; and (v) the Environmental Impact Assessment - 500kV Transmission Line Development for Upper Cisokan Pumped Storage Hydroelectric Power Plant (UCPS) Bandung Regency and Cianjur Regency West Java Province in 2007; (vi) the Social Acceptance Assessment - Upper Cisokan Pumped Storage Hydroelectric Power Plant (UCPS) Bandung Regency and Cianjur Regency West Java Province in 2007; (vii) Supplement of Environmental Management Plan (RKL) and Environmental Monitoring Plan (RPL) - 500kV Transmission Line Development for Upper Cisokan Pumped Storage Hydroelectric Power Plant (UCPS) Bandung Regency and Cianjur Regency West Java Province in 2007; and Revised EIA and EMP (RKL/RPL) for Upper Cisokan Pumped Storage in 2011.

Additional public consultation with the project affected people will be carried out during the project implementation. The comments and suggestions from the disclosures and public consultations undertaken so far have been incorporated into the final EIA and EMP. The EIA and EMP have also been disclosed at the Bank Infoshop in Washington, DC.

Analysis of Alternatives

4. The final selection of the scheme was based on technical, economic, environmental and social considerations, mainly minimizing the need for land acquisition and resettlement.

- **Java-Bali System without the Upper Cisokan Facility.** The ability to meet peak demand requires a reliable supply that can respond rapidly to demand fluctuations. This is best met by hydropower, because it can store energy (unlike wind); it can respond rapidly to load fluctuations (unlike coal) and is more economical than oil, diesel or gas. The PLN Detailed Design Study (2002) dismissed conventional hydropower as an alternative to the pumped storage scheme because of the difficulties of finding a large enough site for the reservoir within the Java-Bali system, without the additional constraints of social and environmental impacts.
- **Alternative Dam/Reservoir Configurations.** Several dam location and configurations have been analyzed over many years. The current option was chosen based on the considerations listed above.
- **Alternative Access Roads.** Three alternative access routes were evaluated during detailed design. The selected route presents the least environmental and social impacts and the least cost.
- **Alternative Quarries.** A review of suitable material sources for the concrete aggregate was undertaken during detailed design. Eight potential sites were reviewed and the Gunung Karang, the existing quarry used for the Saguling hydropower plant built in early 90s by PLN, was selected due to the suitability of the rock types, the availability of resources, and the relatively small environmental or social impacts.
- **Alternative Transmission Line Routes.** Four alternative routes were investigated in the supplementary design study (2007).

Anticipated Major Environmental and Social Impacts

5. The areas required for the pumped storage project are much smaller than those of a conventional hydropower project of similar sizes. Therefore the environmental impacts are usually less significant than the conventional ones. The major environmental impacts of the project include:

- **Land acquisition and household relocation.** See Annex 7.
- **Biodiversity impacts.** Three endangered mammal species were identified in the surrounding project area in a 1 ha remnant secondary growth forest at the margin of the lower reservoir, though all three species have populations in other parts of Java. These endangered species and the 1 ha of the secondary growth forest habitat will be included in a “greenbelt” program around the two reservoirs. The forest patch will be demarcated and protected during construction to prevent risk from construction workers.

- **Downstream river environment impacts.** During construction, discharges of sediment will affect water quality and stream bed pattern. During inundation, the hydrological regime in the Cirumamis and Cisokan Rivers will be affected, albeit temporarily. Finally, during operation, there should be only minor changes to the hydrological regime downstream of the two dams, but changes to erosion and deposition patterns are expected downstream in the Cisokan River, due to the reduced sediment load.
- **Dam safety and reservoir security:** Two large dams (one at height of 98 m, the other at 75.5 m), and three operating ranges in the upper reservoir is 19m, and 4.5m in the lower reservoir, water levels will rise and lower swiftly in response to generation or pumping. This will make the two reservoirs unsafe for use by the community, or for commercial ventures such as aquaculture;
- **Construction-related impacts.** The construction of the dam and its ancillary infrastructure will entail potentially significant negative impacts on communities and surrounding aquatic habitats. The proper management of excavation materials, river and drainage crossings, and the reduction of nuisances such as dust, noise, increased traffic, pedestrian safety concerns, and the presence of a large work force in or near small rural communities, will require careful engineering planning, close supervision, and a continuous and intense community information program. During the construction period, construction and material carrier vehicles will use the existing and new access road and village roads, and partial congestion may occur with some negative impacts upon local traffic. The presence of communities and some schools along some of these roads pose a significant risk for pedestrian and student safety. Other impacts include employment and enterprise opportunities, disturbances to lifestyle, health, and culture from an influx of migrant workers and competition for community services and natural resources.
- **Impacts on private and public infrastructure and cultural resources:** An estimated 1350 private structures (homes, shops, sheds and other buildings), and 47 public structures (2 schools, 4 madrasah, 7 mosque, 34 mushala), one sanitation facility, 13 small bridges and 750 graves will be affected.
- **River and Land Access within the Reservoir Areas:** There will be a loss of river and land access within the reservoir areas to the people who will remain in the Cisokan area. Prior to filling, access to the river beds and the cleared reservoir areas will be prohibited. The reservoir environments will be very hazardous during filling and operation, due to the steep, un-vegetated shorelines and the rapid rise and fall of the water level.

6. The potential indirect and/or long term impacts due to anticipated future activities in the project area include:

- **Increased influx of population.** Socio-economic benefits include the provision of cheaper peak load power and other efficiencies in the Java-Bali network, the construction of a new road and bridges allowing access to more remote hamlets and villages; and local economic benefits during the construction phase (allocation of jobs and the provision of services). It is possible that the new road will increase settlement in the area. The potential for adverse impacts on the existing communities is low, as the area is already heavily developed and populated, and land tenure is in community or private ownership. Land would need to be purchased, or a lease agreement entered into, in order for migrants to settle.

- **Regional socio-economic benefits.** Because of the improved access with the new road, economic links between West Bandung and Cianjur may also reduce producers' costs of transporting local agricultural products to market, and lower the consumers' costs for goods brought into the area. Past experience with water resource development leads the West Bandung Regency government to expect increased growth with the new access road and the local multiplier effects of this project. The Regency has planned for future development in markets and in housing development under its spatial zoning plan, using the pump storage project to induce future growth.
- **Neutral GHG impacts.** Detailed system expansion planning exercises indicate that the proposed project will be almost carbon neutral, because: (a) as the reservoir areas are very small and GHG emissions due to the land use changes are negligible; (b) GHG emission increases caused by increased fossil fuel power generation when pumping can be offset by the reduction of fossil fuel power generation during the peaking hours and the fossil fuel consumption reductions due to the efficiency improvements of fossil fuel fired power plants during the pumping hours.
- **Cumulative Impacts.** No adverse cumulative impacts are expected from project implementation. No other large hydropower projects are planned in the project area. Cisokan location at the upper watershed and its pumped storage scheme will not exacerbate or degrade already existing hydrological or ecological functions in the river.

Mitigation Measures

7. Mitigation and management have been proposed in the EIA to address all of the impacts identified, including a comprehensive EMP for implementation during construction and operation of the scheme. The EMP details the environmental management and supervision organizations, and responsibilities, mitigation measures, capacity training plan, monitoring plan, and budget estimates for implementation. Relevant elements of EMP will be incorporated into bidding documents and contracts in order to ensure effective implementation throughout the pre-construction, construction and operation phases. The main elements of the EMP include:

- A biodiversity management plan which documents an adaptive management approach to biodiversity conservation/protection.
- A physical cultural resources management plan.
- An access road construction environmental management plan.
- A transmission line environmental management plan.
- An environmental specifications for contractors.
- A quarry environmental management plan.
- A reservoir clearance management plan.

8. Additional detailed guidelines and terms of reference were also developed for a construction worker camp management plan; a social and community management plan; and the operation environmental management plan. These three plans will be further detailed by contractors and the project engineer, and will be reviewed and agreed by the Bank three months prior to the start of the construction of the main works or the commissioning of the project. In addition, a watershed management plan will be developed during the early years of the project implementation. This plan will be implemented by PLN during the operation of the project.

9. A dam safety plan has been developed by PLN. The plan has been reviewed and agreed by the Bank and will be implemented by PLN to mitigate negative impacts related to dam safety. The PRP, consisting of internationally and nationally reputed hydropower experts, has been established to undertake periodic, comprehensive and independent reviews of the design, construction, and initial reservoir filling of the project works.

Feasibility study and basic design of the Matenggeng Pumped Storage Project

10. The proposed Matenggeng Pumped Storage project will be located at the junction of the Cijolang river and its tributary, the Cimancing river, on the border between West and Central Java. A detailed Environmental and Social Impact Assessment (with the necessary management plans) will be done at feasibility stage, separately from the consultants doing the feasibility study. The Bank will review the final reports of the study to ensure their compliance with the Bank's safeguards policies.

11. For this component it has been agreed that the development of the safeguards instruments (e.g., EA, LARAP, etc.) will be reviewed and agreed by the Bank before commencing the study and the draft safeguards instruments prepared will also be reviewed by the Bank to ensure its compliance with Bank safeguards policies. If PLN decides to obtain financing from sources other than the Bank, and apply national standards or other financial institutions' policies to the project instead of the safeguards policies/instruments prepared, the Bank will not be responsible for the potential risks.

Panel of Experts

12. An environmental and social Panel of Experts (PoE) has been established to provide independent review and guidance on the treatment of environmental and social issues associated with the UCPS Project. The PoE will provide reports to ENV and PLN on the status and compliance with EMP and Resettlement Action Plan requirements.

Public Consultation and Disclosure

13. Several rounds of focus group and public consultation meetings have taken place. The purpose of each meeting or interview was to convey information to the people regarding the project, and to seek feedback to gain an understanding of their perceptions of the project, their aspirations, and to receive their comments on how the project may affect them. Written documentation on the project was provided, as well as oral presentations and discussions with the meeting attendees or interviewees. Key points from the feedback from the communities, government institutions and NGOs have been taken into the design of the project and safeguard instruments. The consultation process will continue during project implementation.

Annex 9: Financial Analysis

INDONESIA: UPPER CISOKAN PUMPED STORAGE HYDRO-ELECTRICAL POWER (1,040 MW) PROJECT

Historical Context

1. PLN's capacity to deliver quality services depends on the company's ability to maintain its financial condition. In order to remain sufficiently liquid, PLN needs to generate enough cash to meet its operating and capital requirements. Leading into 2004, GoI, which established PLN's retail tariff by decree, implemented seven quarterly tariff increases. Since then GoI has allowed only one tariff increase, implemented in July 2010, at an average of approximately 5.8 percent across all customer categories.²¹
2. Prior to 2005, PLN also benefited from GoI's policy to subsidize petroleum products, but this also led to the over reliance by PLN on the utilization of diesel for power generation. In 2005, GoI removed the fuel subsidy for PLN, which instantly increased its cost of supply. Coupled with a retail tariff level that has remained relatively constant since 2004, PLN was placed in a suboptimal financial position. However, the Law on State-Owned Enterprises mandates that GoI cover any financial shortfall that would arise as a direct result of one of its policies. PLN remained liquid in terms of cash availability since it now receives a substantial PSO subsidy, which augments its revenue from the sale of electricity.
3. In view of PLN's dependence on the PSO subsidy, it is not entirely in control of its own financial condition, and is dependent upon the full and timely payment of the subsidy to remain financially viable. Under the circumstances, the usual financial covenants applied by the World Bank to revenue producing entities – rate of return covenant or a self-financing ratio covenant – cannot apply.²² In this case the most significant measure of PLN's financial condition is its liquidity; therefore GoI, PLN, and the World Bank agreed, under two on-going Bank financed projects with PLN, to the use of a debt service coverage ratio covenant as a proxy for measuring liquidity. In the event of a breach of this DSCR covenant, the Government would take corrective action. A breach of the agreed 1.5x threshold does not by itself constitute a liquidity problem for PLN – it requires a further analysis of the causes of the breach. If GoI and PLN have taken action to address the problem, the Bank has the flexibility to consider the covenant as being in “partial compliance,” or “pending.”
4. Evaluation of the year-end unaudited financial information indicates that PLN has improved its liquidity from 2009 to end 2010. In addition, PLN expects to have sufficient cash at year end 2010 to meet its financial obligations. PLN has also received on January 17, 2011, a ratings upgrade to Ba1 by Moody's, one notch below investment grade, which is the same as Indonesia's sovereign rating.

²¹ To be confirmed upon the release of PLN's audited financial statements.

²² In a circumstance where the tariff does not fully cover costs and yield a profit, a covenant that measures the adequacy of the tariff by itself is not relevant. Moreover, PLN's financial health is largely controlled by the adequacy and timing of the Government's PSO payments.

Past Financial Performance

5. PLN's financial results for 2007-10 are summarized in Table 1. The financial results through 2009 are based on audited financial statements while those for 2010 are estimated as of the year end unaudited financial statements for 2010.

Table A.9.1. PLN Financial Performance 2007-10 [IDR Billions]

		2007 Audited	2008 Audited	2009 Audited	2010 Unaudited
I	Income Statement				
1	Operating revenue excluding PSO	77,438	85,631	91,502	104,271
2	PSO subsidies	36,605	78,577	53,720	59,493
3	Revenue from operations	114,043	164,209	145,222	163,764
4	Operating expenses	(111,506)	(160,598)	(135,276)	(148,785)
5	Operating income	2,537	3,611	9,946	14,978
6	Other income (expenses)	(5,635)	(15,802)	2,257	(3,190)
7	Earnings before tax	(3,098)	(12,191)	12,203	11,788
8	Net income	(5,645)	(12,304)²³	10,356	10,316
II	Balance Sheet				
1	Current assets	43,213	31,076	36,999	46,316
2	Non current assets	230,267	259,643	296,714	322,734
3	Total Assets	273,480	290,719	333,713	369,051
4	Current liabilities	40,276	40,654	37,708	43,202
5	Non-current liabilities	96,791	123,079	154,809	176,034
6	Equity	136,413	126,987	141,196	149,815
7	Total Liabilities & Equity	273,480	290,719	333,713	369,051
III	Cash Flow Statement				
1	Cash flows from operating activities	16,890	7,780	5,898	21,966
2	Cash flows from investment activities	(20,760)	(21,952)	(30,567)	(29,844)
3	Cash flows from financing activities	7,192	4,268	31,324	14,463
4	Net increase (decrease) in cash	3,322	(9,903)	6,656	6,584
5	Beg. of year cash balance	12,968	16,291	6,388	13,043
6	End of year cash balance	16,291	6,388	13,043	19,628
IV	Financial ratios				
1	DSCR	2.18	1.38	0.95	2.34
2	Debt to total asset	50%	56%	58%	59%
3	Current ratio	1.07	0.76	0.98	1.07

6. PLN's financial condition continues to be substantially reliant upon the adequacy and timeliness of GoI's PSO subsidy payments, which covers the revenue shortfall between electricity tariffs and PLN's cost of power supply. This PSO subsidy, which GoI is mandated to pay by law, was 37% of PLN's total revenues in 2009, down from 48% of PLN's total revenues in 2008, as a result of lower operating costs driven by a decline in fuel prices. The PSO is expected to be Rp. 59 trillion for 2010, inclusive of Rp. 4 trillion in arrears from 2009²⁴ (36% of

²³ Taxes incurred even in the instance of consolidated losses due to PLN's subsidiaries being liable for taxes on profits.

²⁴ Total arrears as of end 2009 were Rp. 8.6 trillion.

total revenues) due to an increase in the cost of power supply, resulting from the connection of 1.5 million new customers during the year who are being served by diesel-based generation.

7. GoI has made an effort to make timely payment of the PSO subsidy to PLN. In 2008, a delay in the payment of PSO arrears was immediately rectified by GoI through the clearing in February 2009 of all past arrears. During 2009, although GoI incurred PSO arrears of Rp. 8.6 trillion, these arrears are being paid during 2010-12 under a payment plan agreed upon with PLN. Despite these arrears, PLN has continued to remain sufficiently liquid with a year-end cash balance in 2009 of Rp. 13 trillion, which it has now improved to Rp. 19.6 trillion as of end 2010.

8. PLN has also significantly improved its revenues when compared with 2009; PLN is expected to generate total revenues of Rp. 164 trillion (US\$18.2 billion) in 2010, an increase of 12.7 percent over 2009 revenues of Rp 145 trillion (US\$16 billion). Revenues are expected to increase mainly as a result of (a) a 9.2% increase in sales from 134,784 GWh in 2009 to an expected 147,297 GWh in 2010; (b) an estimated 5.8% average tariff increase; and (c) an increase in the PSO margin from 5% in 2009 to 8% in 2010 ($\text{Cost} \times (1 + \text{Margin}) = \text{Revenue} + \text{PSO}$). Sales revenues, excluding PSO and customer contributions, are expected to increase from Rp. 91 trillion (US\$9.9 billion) in 2009 to Rp. 104 trillion (US\$11.6 billion) in 2010, while PSO subsidies are expected to increase from Rp. 54 trillion in 2009 to Rp. 59 trillion in 2010.

9. PLN is also expected to continue to remain profitable during 2010. Its net operating income is expected to be Rp. 15 trillion (US\$1.67 bn) in 2010, higher than the prior year amount of Rp. 9.9 trillion (US\$1.09 billion). A major contributor to this higher net operating income is the expected higher sales revenue of Rp 104 trillion (US\$11.6 billion). PLN is also expected to book a foreign exchange gain (annualized) of approx. Rp 1.3 trillion (US\$ 149 million) as a result of the strengthening of the IDR, and interest expense of Rp 6.1 trillion (US\$ 678 million) leading to an expected profit before tax of Rp. 11.8 trillion (US\$ 1.3 billion) in 2010. PLN's taxes are expected to be Rp 1.4 trillion (US\$ 164 million), which are expected to yield a net profit of Rp. 10.3 trillion (US\$ 1.15 billion) against a 2009 net profit of Rp. 10.4 trillion (US\$ 1.1 billion).

10. While the following activities could potentially lead to a deterioration of PLN's financial condition, they are not expected to impair its operations or its investment program significantly due to the availability of sufficient cash reserves to make up for any potential shortfalls. PLN is also expected to remain liquid and profitable during 2010.

- GoI approved a 10 percent average tariff increase across all customer categories from July 1, 2010. However, as a result of industrial consumers having lobbied for an 18 percent cap on their tariff increase, it now appears that the realized average increase for 2010 was about 5.8 percent. PLN management is in the process of negotiating a removal of this 18 percent cap during the first half of 2011. The difference in revenues and production costs would therefore need to be covered by the PSO subsidy in a timely manner.
- PLN has connected 1.5 million new customers during 2010. However, due to the delay in the commissioning of the 10,000 MW crash program plants, these customers

are being served through diesel-based generation, with higher than average operating costs.²⁵ In addition, the heavy utilization of fuel oil in PLN's Combined Cycle Gas Turbine (CCGT) power plants due to a lack of gas supply has continued in 2010, with approximately 5,580 MW out of PLN's total 6,341 MW of CCGT capacity being powered by fuel oil instead of being fired by gas. This practice exposes PLN to the volatility of oil prices. While PLN has entered into long-term contracts with its fuel suppliers in order to secure oil supply, these contracts have escalation clauses that link the price to those prevailing in the regional oil markets. GoI has however continued to cover the difference in operating costs and revenues through the PSO, even during 2008 when global oil prices had increased significantly.

- The potential cost increase combined with a lower than expected tariff increase has led to PLN having a PSO requirement of Rp. 59 trillion for 2010, Rp. 4 trillion higher than the 2010 budgeted amount of Rp. 55 trillion. These subsidies are expected to represent 36% of PLN's total revenues in 2010. Therefore, any delay in the payment of the PSO by GoI would normally have led to deterioration in PLN's financial condition. However, PLN has also experienced a delay in its 10,000 MW investment program by 12-18 months with only 900 MW expected to come online by end 2010.²⁶ At the same time, PLN has already reached financial closure for its entire 10,000 MW program. As a result, it has ample liquidity to meet its financial obligations, with an increase in its cash balance from Rp. 13 trillion at year-end 2009 to Rp. 19.6 trillion as of end 2010.
- In addition, according to PLN, as of end 2010, it has only spent, Rp. 37 trillion out of a planned Rp. 73 trillion in capital expenditures. This slowdown in PLN's investment plan has contributed to the high cash balance of Rp. 19.6 trillion (US\$ 2.18 billion) at year end 2010.

11. PLN has also continued to manage its cash position effectively, and remains liquid. An important reason for its strong liquid position has been PLN's ability to access the global and local banking and bond markets. With large companies such as PLN, it is common to access financing when market conditions are most favorable. A key by-product of dealing with commercial lenders is that they incorporate World Bank covenants into their lending requirements, and they can treat breaches of covenants as material adverse changes in a borrower's financial condition. Given that the DSCR covenant is the subject of an international agreement, the potential for a drop below the agreed level could have a negative effect on PLN's ability to raise funding in the financial markets, and might cause problems vis-à-vis PLN's bankers and bondholders. It is therefore in the interest of the Government, PLN, and the

²⁵ Due to the combination of higher fuel prices, and an increase in the number of customers (1.5 million new customers were connected in 2010) who are mainly being serviced through diesel based generation, PLN's operating expenses in 2010 are expected to increase by 11.7% from Rp. 135 trillion (US\$ 14.9 billion) in 2009 to Rp. 148.8 trillion (US\$ 16.6 billion). PLN's cost of fuel is expected to increase from Rp. 76.2 trillion (US\$ 8.2 billion) to Rp. 84 trillion (US\$ 9.36 bn) in 2010. Oil prices reached US\$ 80/bbl in September 2010 (average US\$ 79.39 for the prior 52 weeks) as compared to US\$ 69/bbl in September 2009 (average US\$ 60.71 for the prior 52 weeks) (IEA Data). In addition, the heavy utilization of fuel oil in PLN's Combined Cycle Gas Turbine (CCGT) power plants due to a lack of gas supply has continued in 2010. The Government has however continued to cover the difference in operating costs and revenues through the PSO, even during 2008 when global oil prices had increased significantly.

²⁶ The total installed capacity had been expected to be 1,300 MW out of the proposed 10,000 MW by end 2010.

Indonesian power sector more generally that the Government arranges to make full and timely payments of the PSO subsidy to PLN.

12. From a financial point of view, PLN is sufficiently liquid and has adequate headroom to absorb the necessary debt to cover its investment program and its operations, so long as GoI meets its obligations to PLN. According to PLN's estimates, its credit capacity is US\$ 2 billion as of October 2010. In addition, GoI equity represents about 40 percent of PLN's asset base. PLN would therefore have further capacity to leverage additional financing to cover future investments (provided it meets its debt covenant requirements with its lenders). PLN has demonstrated the ability to borrow from both the local and global financial markets to meet its investment needs. Its borrowing capacity will remain contingent upon GoI's backing of PLN's financial obligations.²⁷

PLN's Financial Forecasts

13. PLN is executing a large capital expenditure program during 2011-14. Estimates based on the information provided by PLN confirmed that despite the financing requirements of the capital investment program, PLN will be able to maintain sufficient liquidity and a minimum DSCR of 1.5x during the projection period 2010-16 in accordance with the existing covenant with the World Bank under the ongoing project loan.

14. The projected performance is based on the best information currently available. These projections will continuously be under review during the period of the three ongoing projects with PLN, and during the proposed project. As circumstances change, GoI and PLN will need to adjust their policies in order to maintain PLN's liquidity and the quality of its service.

15. Conclusions reached through the analysis are based on the assumption that PLN will be able to (a) receive outstanding 2009-10 PSO receivables as per the agreed payment plan, (b) obtain proposed tariff increases during each of 2011-12, (c) benefit from an 8 percent margin reflected in the PSO, and (c) spread its remaining payables to third parties (mainly Pertamina) over three years.

16. The following are the key assumptions behind the forecasts:

- a) Outstanding PSO receivables of Rp. 8.5 trillion from 2009, of which Rp. 4 trillion is expected to have been received during 2010. The PSO receivables at end 2010 are expected to be Rp. 10.7 trillion which are expected to be paid by the Government during 2011-13.
- b) An average tariff increase of 6.4 percent during 2010-12. This tariff increase was already factored in by the Parliament in estimating the PSO allocation for 2010.²⁸

²⁷ PLN has commenced the process of raising funding for the second phase of the 10,000 MW crash program that requires an estimated funding of US\$ 16 billion, US\$ 6 billion of which is planned to be financed through internal cash and borrowing, with the remaining US\$ 10 billion investment to be made by private developers, and investors in IPP projects.

²⁸ On October 26, 2010 Parliament voted on a 2011 budget that does not contemplate a tariff increase for PLN. The budget also indicates a reduction in the PSO subsidy for 2011 by 25 % (assuming a Rp. 55 trillion PSO that was budgeted for 2010) from the 2010 amount to Rp. 41 trillion (US\$ 4.5 billion). According to the Ministry of Finance, the remaining 2009 PSO arrears of Rp. 4.6 trillion (US\$ 506 million) may be paid in 2011, or they could be delayed to 2012. The Government has

- c) The PSO for 2010 already includes an 8 percent margin approved by the Government as agreed upon by the Parliament. PLN will receive the expected approval from Parliamentary for a similar margin in 2011 through the normal government budget process; and continued strong support of Parliament for maintaining this 8 percent margin.
- d) PLN's 2009 audited financial information indicates that it has Rp. 12.4 trillion in payables to third parties as of end 2010 a third of which is to Pertamina largely for fuel supplies. PLN's Senior Management informed the World Bank Team that Rp. 5 trillion of this amount is not due given that it is paid in perpetuity on a net 30 day payable basis without incurring financing charges, and that going forward the remaining Rp. 7.4 trillion will be spread out to make the payments coincide with PLN's revenue and PSO inflows (including the payment of PSO arrears owed to the company by the Government). Therefore, PLN's payables to third parties of Rp. 7.4 trillion could be made over a three year period (Rp. 2 trillion in 2011, Rp. 3.4 trillion in 2012 and Rp. 2 trillion in 2013) or longer duration.

17. As noted previously, the above four factors would enable PLN to remain in compliance with the DSCR requirement of 1.5x during the forecast years of 2010-16 as indicated in the attached Table 5.

18. Although PLN is expected to meet the DSCR covenant, during 2011 (PLN's DSCR as of end 2010 was 2.34 x) there is little room for deviation from the forecasts. Therefore, PLN's financial condition would need to be monitored closely, particularly during 2011, during which PLN will need to pursue its financial strategy along the lines of the current financial forecasts, to ensure that it remains on track to comply with the covenant.

19. The company is in a transitional period during which, as a result of the proposed tariff increases, it expects to gradually reduce its reliance on Government subsidies to become more financially self-sustaining.²⁹ As a result of this transition, the company is expected to change its character in 2012 from having liquidity as its main focus to having efficiency of service as the key performance driver. PLN is expected to remain sufficiently liquid with a year-end cash balance that is estimated to average US\$ 827 million during 2011-12. This transition is dependent upon the Government honoring its own obligations to PLN and to the power sector, through its approval of proposed tariff increases. As a result, beyond 2012, PLN may well need to develop indicators that would track improvements in efficiency and effectiveness as a measure of its performance.

20. A summary of PLN's financial forecasts are provided in Table 2.

set aside Rp. 10 trillion (US\$ 1.1 billion) in a contingency fund to dampen the fiscal repercussions of a higher claim on the PSO budget. As a result, PLN would need to amend their projections to take these recent developments into account.

²⁹ Government subsidies are expected to decline from 37 percent of revenues in 2011 to 25 percent of revenues by 2011.

Table A.9. 2. PLN Financial Forecasts 2011-16 [IDR Billions]

		2011	2012	2013	2014	2015	2016
I	Income Statement						
1	Operating revenue excluding PSO	119,978	142,310	169,925	189,322	210,660	234,277
2	PSO subsidies	69,779	60,427	51,283	52,231	64,959	77,232
3	Revenue from operations	189,757	202,737	221,208	241,553	275,619	311,509
4	Operating expenses	(167,101)	(180,338)	(193,122)	(208,486)	(240,143)	(272,558)
5	Operating income	22,656	22,399	28,086	33,067	35,476	38,951
6	Other income (expenses)	(11,910)	(13,199)	(16,214)	(18,946)	(18,403)	(20,488)
7	Earnings before tax	10,746	9,200	11,872	14,121	17,073	18,463
8	Net income after tax	8,935	5,556	6,537	7,282	8,641	8,336
II	Balance Sheet						
1	Current assets	32,263	30,724	30,893	32,890	35,098	37,520
2	Non current assets	386,410	447,690	483,886	525,820	573,841	602,853
3	Total Assets	418,674	478,414	514,778	558,710	608,939	640,373
4	Current liabilities	33,545	33,065	36,743	36,152	45,315	48,626
5	Non-current liabilities	221,815	270,258	290,675	322,557	350,303	365,258
6	Equity	163,314	175,092	187,360	200,001	213,322	226,490
7	Total Liabilities & Equity	418,674	478,414	514,778	558,710	608,939	640,373
III	Cash Flow Statement						
1	Cash flows from operating activities	21,624	33,170	37,483	42,104	47,018	50,675
2	Cash flows from investing activities	(79,166)	(82,412)	(59,395)	(66,749)	(75,599)	(58,926)
3	Cash flows from financing activities	44,924	50,559	21,892	24,641	28,589	8,245
4	Net increase (decrease) in cash	(12,618)	1,317	(19)	(4)	7	(6)
5	Beg. of year cash balance	19,628	7,010	8,326	8,307	8,303	8,310
6	End of year cash balance	7,010	8,326	8,307	8,303	8,310	8,305
IV	Financial ratios						
1	DSCR	1.88	2.70	2.22	2.11	2.42	1.99
2	Debt to total assets	61%	63%	64%	64%	65%	65%
3	Current ratio ³⁰	0.96	0.93	0.84	0.91	0.77	0.77

Project FRR analysis

21. The project shall be undertaken as a PLN unit instead of as a separate legal entity. Its capital expenditures, along with its revenues and expenses shall be consolidated into the parent PLN's financial statements. In order to gauge the impact of the project on PLN's financial condition, a separate financial analysis of the project was considered to be prudent. Based on this analysis, it was determined that the project has a pre-tax FRR of 16.1 percent and a positive NPV of Rp. 2.9 trillion.³¹ The weighted average cost of capital assumed for PLN is 12 percent

³⁰ PLN's current ratio is expected to be below 1.0 in the forecast years mainly due to the addition of construction in progress to the current liabilities. Payables related to construction in progress are not financed from revenue from operations but from loans. Some utilities exclude construction in progress from the calculation of the current ratio. Others recognize construction in progress only after it has been paid for. PLN has chosen to include construction in progress in its financial statements, hence the lower current ratio.

³¹ This includes the impact of a corporate tax rate of 25 percent. PLN calculates taxes on a consolidated basis for the entire corporation, and not on a project basis. It therefore believes that unlike coal fired plants that produce sufficient power to generate profits that would contribute to PLN's tax burden, this project (with an average 4 hour generation per day) is not being developed to generate profits, but rather to reduce PLN's operating costs by substituting oil with hydro. In the event the tax rate of 25 percent was not applied the FRR would be 16.1%.

based on a realized WACC for 2010 of 9.8 percent and an expected higher WACC in future years. The project therefore provides a positive benefit to PLN's financial condition while also enabling PLN to meet its objective of substituting diesel based generation with hydro during peaking hours.

22. PLN is expected to charge an average tariff of Rp. 1,455/kWh in 2017, i.e. upon commercial operations, which is expected to be escalated by 5 percent annually. The tariff is assumed to be the peaking tariff charged to industrial consumers using the weighted average tariff for large industry (category I3 and I4) and applying a peaking penalty of 50 percent (see Table A.9.4). The project's operating costs, which comprise pumping costs, and project operations and maintenance use the following assumptions. Table A.9.3 indicates the pumping cost and analysis.. The cost of operations and maintenance is estimated to be 1 percent of the capital expenditures. The ratio of energy generated to energy consumed for pumping is 78 percent.

Table A.9.3: Pumping Cost Analysis

<u>Pumping Costs</u>	
Coal price per ton (US\$)	72
Coal price per ton (IDR)	662,400
Coal price per kg (IDR)	662.40
Specific fuel consumption	54%
Variable Cost per kWh (Coal price per kg x SFC) (IDR)	358.97
Fixed Cost (Generation + Transmission (IDR))	230.00
Total cost of pumping per kWh 2010	588.97
Total cost of pumping 2017 per kWh (VC Escalated at 5%)	735.10

Table A.9.4: Tariff Assumptions

Tariff	I3	I4
Industry Tariff per kWh	718	592
Energy Sales (kWh) 2010	34,674,107,975	12,286,986,947
Weighted Average Tariff per kWh	685.03	
Peaking Coefficient	1.5	
Industry Peaking Tariff 2010 per kWh	1,027.55	
Tariff 2017 per kWh(Escalated by 10% through 2012 and 2.75% thereafter)	1,455.14	

Table A.9.5

IDR billions	2007 Audited	2008 Audited	2009 Audited	2010 Unaudited	2011 Projected	2012 Projected	2013 Projected	2014 Projected	2015 Projected	2016 Projected
Key Assumptions										
<i>Tariff (Rp/kWh)</i>	629	653	665	703	729	801	880	904	928	952
<i>Proposed increase in tariffs</i>	0%	0%	0%	5.6%	3.7%	10%	10%	2.73%	2.65%	2.59%
<i>ICP (US\$/barrel)</i>		80	61	80	80	85	85	85	85	85
<i>Exchange rate (Rp/US\$)</i>	9100	9,693	9,400	9,200	9,250	9,300	9,400	9,500	9,500	9,500
<i>Margin</i>	0%	0%	5%	8%	8%	8%	8%	8%	8%	8%
Operating Revenue										
Operating revenue excluding subsidy	79,377	87,672	92,645	111,270	119,978	142,310	169,925	189,322	210,660	234,277
PSO subsidy	15,038	64,694	49,049	54,153	69,779	60,427	51,283	52,231	64,959	77,232
Total operating revenue	94,415	152,366	141,694	165,423	189,757	202,737	221,208	241,553	275,619	311,509
Operating Expenses										
Cash paid to employees	(5,994)	(7,287)	(8,436)	(9,842)	(14,331)	(15,385)	(16,483)	(17,663)	(18,933)	(20,298)
Cash paid to suppliers	(65,744)	(128,652)	(121,641)	(126,536)	(137,289)	(143,821)	(153,440)	(166,008)	(193,631)	(222,346)
Total operating expenses	(71,739)	(135,939)	(130,077)	(136,377)	(151,621)	(159,206)	(169,923)	(183,671)	(212,564)	(242,644)
<i>Payment Plan</i>										
<i>Payment to third parties</i>				-	(2,000)	(3,441)	(2,000)			
<i>Proceeds from PSO arrears</i>				-	4,000	4,743	2,000			
Net operating income	22,676	16,427	11,617	29,046	40,137	44,833	51,286	57,882	63,055	68,865
Non operating revenue	667	511	299	852	(350)	(715)	(715)	(716)	(716)	(716)
Taxes (net of restitution)	(1,171)	(1,450)	(809)	(536)	-	-	-	-	-	-
Net non-operating income less tax	(505)	(939)	(510)	316	(350)	(715)	(715)	(716)	(716)	(716)
TOTAL CASH BEFORE DEBT SERVICE	22,172	15,487	11,107	29,361	39,786	44,117	50,570	57,166	62,339	68,150
Interest Paid	5,282	7,707	5,209	7,396	9,119	11,601	13,665	16,224	17,687	19,772
Principal Repayments	4,883	3,526	6,540	5,169	12,091	4,730	9,103	10,871	8,059	14,432
TOTAL DEBT SERVICE	10,164	11,233	11,749	12,565	21,210	16,330	22,768	27,095	25,746	34,205
Dividends			-	4,000	4,436	2,778	3,269	3,641	4,320	4,168
TOTAL DEBT SERVICE and DIVIDENDS	10,164	11,233	11,749	16,565	25,646	19,108	26,037	30,736	30,067	38,372
DSCR	2.18	1.38	0.95	2.34	1.88	2.70	2.22	2.11	2.42	1.99

Notes:

1. 2007-09 based on audited financial statements, 2010 based on unaudited financial statements.
2. 2011-16 based on PLN financial projections assuming annual tariff escalations.
3. Forecasts assume payment of Rp. 7.4 trillion of Rp. 12.4 trillion of payment to third parties over 3 years (2011-13) and the receipt of PSO arrears of Rp. 10.7 trillion over three years (2011-13).

