

See Annex 9 | Economic and
Financial Analysis

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Report No.: 50664-LA

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED IDA GRANT

IN THE AMOUNT OF SDR 12.6 MILLION (US\$20 MILLION EQUIVALENT)

TO THE

LAO PEOPLE'S DEMOCRATIC REPUBLIC

FOR A

RURAL ELECTRIFICATION PHASE II PROJECT

IN SUPPORT OF THE

RURAL ELECTRIFICATION (APL) PROGRAM

December 16, 2009

**Infrastructure Unit
Sustainable Development Department
East Asia and Pacific Region**

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CURRENCY EQUIVALENTS

(Exchange Rate Effective November 23, 2009)

Currency Unit = Lao kip (LAK)

LAK 8,500 = US\$1

US\$ 1 = SDR 0.62897

SDR 1 = US\$1.58990

FISCAL YEAR

MEM: October 1 – September 30

EdL: January 1 – December 31

ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank	kV	Kilovolt
APL	Adaptable Program Loan	kW	Kilowatt
ASTAE	Asia Sustainable and Alternative Energy Program	kWh	Kilowatt-hour
CAS	Country Assistance Strategy	Lao PDR	Lao People's Democratic Republic
DOE	Department of Electricity	LV	Low voltage
DSM	Demand-side management	M	Meter
EdL	Electricité du Laos	MEM	Ministry of Energy and Mines
EGAT	Electricity Generating Authority of Thailand	MOF	Ministry of Finance
ESCO	Electrification service company	MV	Medium voltage
ESMAP	Energy Sector Management Assistance Program	PHRD	Policy and Human Resources Development Fund (Japan)
ESSF	Environment and Social Frameworks	NORAD	Norwegian Agency for Development Cooperation
FMS	Financial management System	NPV	Net present value
FY	Fiscal year	NSEDP	National Socio-Economic Development Plan
GAP	Gender Action Plan	QCBS	Quality-and Cost-Based Selection
GDP	Gross domestic product	RE	Rural Electrification
GEF	Global Environment Facility	REF	Rural Electrification Fund
GoL	Government of Lao PDR	REFS	REF Secretariats
GWh	Gigawatt-hour	REP	Rural Electrification (APL) Program
HV	High voltage	REP I	Rural Electrification Phase I Project
ICB	International Competitive Bidding	REP II	Rural Electrification Phase II Project
IDA	International Development Association	SHS	Solar home system
IPP	Independent Power Producer	SPRE	Southern Provinces Rural Electrification Project
JICA	Japan International Cooperation Agency	Wp	Watts-peak

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LAO PEOPLE'S DEMOCRATIC REPUBLIC

Rural Electrification Phase II Project
In support of the Rural Electrification (APL) Program

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LAO PEOPLE'S DEMOCRATIC REPUBLIC

**Rural Electrification Phase II Project
In support of the
Rural Electrification (APL) Program**

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC
(EASIN)

Date: December 16, 2009	Team Leader: Jie Tang
Country Director: Annette Dixon	Sectors: Power (90%); General public admin sector (10%)
Sector Manager/Leader: Vijay Jagannathan/Jeeva Perumalpillai-Essex	Themes: Rural services and infrastructure (P); Regulation and competition policy (S)
Project ID: P110978	Environmental screening category: B
Lending Instrument: Grant	Safeguard screening category: S2

Program Financing Data							
APL	Indicative Financing Plan				Estimated Implementation Period		Recipient
	IDA (US\$m)	%	Others (US\$m)	Total (US\$m)			
APL 1	10.0	27.6	26.27	36.27	02/28/2006	03/31/2010	Lao People's Democratic Republic
APL 2	20.0	55.9	15.80	35.80	01/01/2010	12/31/2013	Lao People's Democratic Republic
Total	30.0	41.6	42.07	72.07			

Note: APL stands for Adaptable Program Loan.

Project Financing Data—APL Phase II							
<input type="checkbox"/> Loan <input type="checkbox"/> Credit <input checked="" type="checkbox"/> Grant <input type="checkbox"/> Guarantee <input type="checkbox"/> Other:							
For Loans/Credits/Others:							
Total Bank financing (US\$m): 20.0							
Proposed terms: Standard for IDA Grant							
Financing Plan (US\$ million)—APL Phase II							
Source	Local	Foreign	Total				
BORROWER/RECIPIENT	4.06		4.06				
INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA)		20.00	20.00				
INTERNATIONAL FINANCE CORPORATION (IFC)		3.88	3.88				
ENERGY SECTOR MANAGEMENT ASSISTANCE PROGRAM (ESMAP)		0.50	0.50				
LOCAL COMMUNITIES	3.36		3.36				
COFINANCING (NORAD)		4.00	4.00				
Total:	7.42	28.38	35.80				
Recipient: Lao People's Democratic Republic (Lao PDR)							
Responsible Agency: Ministry of Energy and Mines (MEM) and Electricité du Laos (EdL)							
Estimated Disbursements of IDA Grant (Bank FY/US\$ million)—APL Phase II							
FY	10	11	12	13	14		
Annual	2.00	8.50	7.00	2.00	0.50		
Cumulative	2.00	10.50	17.50	19.50	20.00		
Project implementation period: January 2010 – December 2013							
Expected effectiveness date: February 28, 2010							
Expected closing date: June 30, 2014							

Does the project depart from the CAS in content or other significant respects? Ref. PAD I.B	[] Yes [X] No
Does the project require any exceptions from Bank policies? Ref. PAD IV.G	[] Yes [X] No
Have these been approved by Bank management?	[] Yes [] No
Is approval for any policy exception sought from the Board?	[] Yes [] No
Does the project include any critical risks rated "substantial" or "high"? Ref. PAD III.E	[] Yes [X] No
Does the project meet the Regional criteria for readiness for implementation? Ref. PAD IV.G	[X] Yes [] No

Project development objective Ref. PAD II.C; Annex 3 The development objectives of the Phase II project are to (a) increase access to electricity of rural households in villages of Project provinces and (b) further improve the financial performance of EdL.
Project description Ref. PAD II.D; Annex 4 EdL Component—electrify about 27,700 rural households through connection to the grid. MEM Component—electrify about 10,000 households through off-grid technologies.
Which safeguard policies are triggered, if any? Ref. PAD IV.F; Annex 10 Environmental Assessment (OP/BP/GP 4.01) Involuntary Resettlement (OP/BP 4.12) Indigenous Peoples (OD 4.20, being revised as OP 4.10)
<i>Significant, nonstandard conditions, if any, for: Ref. PAD III.F</i>
Board presentation: All conditions of Board presentation have been satisfied.
Loan/credit effectiveness: Effectiveness condition. (i) The Subsidiary Agreement has been executed on behalf of the Recipient and the Project Implementing Agency; (ii) NORAD's written confirmation to the Recipient and the Association that all internal approvals have been obtained for NORAD to make available the Co-financing; and (iii) the REF Manual has been adopted by the Recipient.
Covenants applicable to project implementation: (a) Flow and Utilization of Project Funds. Proceeds of the IDA Grant made available to EdL will consist of 80 percent in sub-grant and 20 percent in a loan comparable to IBRD terms and conditions. (b) Implementation covenants. MEM shall maintain a financial management system, including a computerized accounting system to support Project accounting activities, acceptable to the Bank. EdL and MEM shall submit to the Bank within the agreed timeframe: (i) semi-annual project progress reports; (ii) quarterly financial management reports; (iii) annual project-account audit reports; and (iv) a project completion report. (c) Safeguard Aspects. EdL and MEM shall implement the agreed Environmental and Social Safeguard Policy Frameworks for both grid extension and off-grid investment activities. (d) Financial Aspects. Implement the Sustainability Action Plan as agreed, to adjust tariff and off-set existing and future government account receivables. Financial covenants include: (i) maintaining a self-financing ratio of no less than 15 percent of the annual average of its capital expenditures incurred or expect to be incurred for that fiscal year, the previous fiscal year and the following fiscal year; (ii) maintaining net revenues of no less than 1.3 times annual projected debt service payments; and (iii) maintaining the ratio of its long-term debt to no more than 1.5 times its equity.

I. STRATEGIC CONTEXT AND RATIONALE

A. Country and Sector Issues

1. With a population estimated at 5.9 million in 2008, and growing at a relatively rapid rate of 2.1 percent annually, the Lao People's Democratic Republic (Lao PDR) is characterized by a rich cultural and ethnic diversity where almost half the population belongs to minority groups concentrated in the upland areas. Population density in the Lao PDR is very low, although it has increased from only 15 people per square kilometer in 1985 to 24 people per square kilometer in 2005. About 73 percent of the population lives in rural areas. A large majority of the population derives its livelihood from agriculture, which accounts for more than half of the country's gross domestic product (GDP).

2. **Progress toward Rural Development and Poverty Reduction.** The Lao PDR has continued to make progress in poverty reduction. GDP growth between 1990 and 2006 averaged 6 percent a year. In 2007, it reached 7.6 percent before slowing in 2008 to about 7 percent as the effects of the global financial crisis began to be felt in the second half of the year. The average real GDP growth between 2006 and 2008 is 7.6 percent. Approximately 27 percent of the population was living below poverty in 2007/2008. The Government of Lao PDR's (GoL's) National Growth and Poverty Eradication Strategy, which provided the policy framework for rural electrification, was succeeded by the National Socio-Economic Development Plan (NSED) 2006–10, approved by the National Assembly in July 2006. The overall development strategy for the NSED includes transforming the multi-sectoral economy from uneven performance to fast and stable development within the market mechanism guided by the state. Poverty reduction remains the key thematic area of the plan. This will be achieved through enlarging economic opportunities, the provision of basic social and essential economic services, ensuring security, and facilitating the participation and empowerment of the poor in economic, social, political, and other arenas to reduce poverty on a sustainable basis. Reliance on external support to the budget remains high; donor-funded programs account for nearly 40 percent of total public expenditures.

3. **Rural Electrification.** Rural electrification is a major priority of the GoL for the power sector. The GoL has an ambitious goal of electrifying 90 percent of the country's households by 2020 (70 by 2010 and 80 by 2015). Increasing household connections from about 16 percent in 1995 to about 45 percent in 2004 and to 63 percent as of June 2009 was a remarkable achievement in the socioeconomic development of the Lao PDR. Through the implementation of four projects funded by the International Development Association (IDA), Norwegian Agency for Development Cooperation (NORAD), and Global Environment Facility (GEF), and one project funded by the Asian Development Bank (ADB), the planning and implementation capabilities of Electricité du Laos (EdL, the country's electricity utility) for conventional rural electrification have markedly improved. However, as electrification moves to increasingly remote areas, grid-extension rural electrification becomes more and more costly, which has led the GoL to promote off-grid options, with emphasis on renewable technologies.

4. **Hydropower Development.** Another priority of the power sector is to develop the rich hydropower resources to increase hydropower exports to neighboring countries for revenue earning. Despite the global economic downturn during the past years, which has stalled a number of hydropower projects in the country, the drivers of development in the hydropower sector in the Lao PDR have remained fundamentally unchanged. Demand in the Greater Mekong Subregion¹ (GMS) for hydropower from the Lao PDR will continue to expand as neighboring countries, such as Thailand and Vietnam, and—not the least—China, further develop their economies. Strong government commitment to private sector-led investment in hydropower development is evidenced by the approval of the revised Electricity

¹ The Greater Mekong Subregion consists of Cambodia, Lao PDR, Myanmar, Thailand, People's Republic of China, and Vietnam'.

Law by the National Assembly in 2008, and the country's active participation in the GMS Forum to promote international investment in hydropower for cross-border power trade. All hydropower projects currently under construction, most of which are for export with foreign investments, will lead to a fivefold expansion of installed capacity from the current 682 MW to 3,236 MW by 2013, with annual gross revenues increasing from some US\$130 million to US\$500–600 million.

5. **Power Sector Sustainability.** Financial sustainability of the power sector is also one of the main objectives of the GoL. EdL, the utility company that owns and operates the transmission and distributions system in the country, as well as the existing hydropower plants, except for Nam Theun 2, was corporatized in 1997, remaining wholly GoL-owned. Cost and profit centers were created within EdL. EdL's operational efficiency and financial viability have been improved remarkably over the past years as a result of implementation of the action plan for financial sustainability of the power sector (Sustainability Action Plan, 2005–2011) under the Rural Electrification Phase I Project (REP I) of the Bank-supported Rural Electrification (APL) Program (REP). EdL reported a profit for the first time in 2007 because of the tariff adjustments since 2005 that were in line with the agreed tariff reform during the period 2005–11. In addition, distribution system losses were reduced from more than 20 percent in 2005 to about 13 percent in June 2009, and arrears owned by government agencies were reduced after settlement of the arrears. At the same time, EdL has significantly improved its technical capacity and is independently able to carry out system planning, design, supervision of construction, operation and maintenance, and safeguard management of medium-voltage (MV) and low-voltage (LV) network expansion projects for rural electrification.

6. **Power System Planning and Interconnection Issues.** The Lao PDR has four principal unconnected grids. All these grids are connected with the Thailand system, and they export hydropower to Thailand (and will soon export hydropower to Vietnam and Cambodia as well) over high-voltage (HV) links, and simultaneously import thermal-based electricity from Thailand at MV. This situation will persist, certainly during the tenure of the REP, until the Lao PDR has a fully integrated transmission grid that can facilitate development of national, integrated generation expansion plans and help maximize utilization of domestic hydropower generation. The increased substitution of thermal energy in the neighboring countries by renewable energy and development of a demand-side management (DSM) and energy efficiency (EE) program in the country will have positive impacts on climate change.

7. **Barriers to Achieving Global Environment Benefits.** The project also aims to develop and use unconventional renewable energy, which in the Lao PDR is in a nascent stage. The Ministry of Energy and Mines' (MEM's) off-grid model has just begun—during REP I—to develop a firm regulatory and sustainability foundation and a sound technology and planning base. Key barriers to creating conditions that are supportive of increased use of renewable energy include: (a) insufficient capacity to prepare and implement integrated projects that would provide most cost-effective delivery and productive use of electricity in rural areas; (b) limited access to financing for project investments; and (c) lack of private sector capacity for scaling up implementation of renewable energy projects for rural electrification.

8. DSM and EE have just received—during REP I—attention by the GoL. Under REP I, a DSM and EE unit was created within EdL an Action Plan for DSM and EE was prepared by consultants, and an EE program focusing on DSM were piloted in four government buildings that achieved a reduction in electricity consumption of 8 percent. Public awareness on DSM and EE is still in its infancy stage. Continued support are needed to implement the action plan for DSM and EE and to remove the barriers, which were identified in REP I, including: (a) a lack of basic data on electricity consumption and end-use patterns by rate class; (b) a lack of public or private sector capacity for program planning and implementation; (c) a lack of technical expertise or awareness among end-use customers of EE

technologies and practices; (d) a lack of available financing mechanism to support investment; and (e) little or no appreciation of the benefits of EE.

9. **Policy Fit with the Lao PDR Climate Change Strategy.** The Water Resources and Environmental Agency (WREA) in the prime minister's office, is the GEF national focal point. The WREA is responsible for the GoL's Climate Change Strategy. The climate change issues that are of particular concern to the WREA include: consumption by the industry, transport, and agriculture sectors of fossil fuels (especially lignite for power generation and diesel oil); methane emissions from paddy fields; use of fuel-wood and charcoal in rural areas; and reforestation and grasslands conservation. REP I and Rural Electrification Phase II Project (REP II) provide a close fit with the GoL's Climate Change Strategy: (a) emphasizing on DSM and EE improvements; (b) fostering more efficient and advanced technologies in all fields of electrification; and (c) promoting renewable energy development, such as small-scale hydropower, solar, and biomass energy.

B. Rationale for IDA Involvement

10. Since 1987 IDA has supported four successive rural electrification projects in the Lao PDR. During the past two decades, IDA has directly supported connection to the grid of about 150,000 households. In addition to investment in grid extension to connect rural households to the grid, these projects provide a platform for continued Bank support to GoL in policy dialogue, sector reform, and capacity building in the power sector. They are also instrumental to the fast expansion of rural electrification and remarkable improvement of the financial performance of EdL achieved so far.

11. **Rural Electrification.** Acceleration of rural electrification is an explicit thrust of GoL in its poverty reduction efforts. An IDA- and GEF-financed rural electrification project, Southern Provinces Rural Electrification (SPRE), which was closed on December 31, 2004, helped reinforce the foundations of a sound rural electrification program in the Lao PDR. The REP builds on the lessons and experiences of SPRE and the capacity created within MEM and EdL. Concessionary lending terms are vital for rural electrification, which requires capital subsidies to achieve social objectives. It is also recognized that there is scope for attracting funding for rural electrification from nontraditional sources, if mechanisms are devised to blend necessary funding with private funding. During the implementation of REP I, IDA and GEF provided grant funding and NORAD provided parallel financing for MEM to support its rural electrification Off-Grid Investment Program and lay foundation for a Rural Electrification Fund (REF), which was established in August 2005. With support from these grants under REP I, the necessary legal, regulatory, and institutional arrangements were completed. As a result, private sector investors, who are interested in investing in rural electrification projects, will be able to gain access to the REF, which is capitalized through the repayments by all off-grid consumers electrified under SPRE, REP I, and other donor-financed off-grid projects. Under this funding scheme, MEM would initialize the operation of the REF Secretariat (REFS) at the beginning of REP II, and both local and international consultants would be hired through REP II to assist MEM in the initial operation and management of the REF and the REFS. Continuing support from IDA, GEF, NORAD, and Energy Sector Management Assistance Program (ESMAP) to MEM is important for successful implementation of the GoL's rural electrification program.

12. **Commercialization of EdL.** IDA and ADB have collaborated in the commercialization of EdL since the early stage. Both agencies supported the tariff increase completed by 2004. The follow-up adjustment of tariff structure and levels over 2006–11 supported by IDA is considered not only a critical part of the Sustainability Action Plan for both REP I and II, but also has supported separation of EdL's commercial objectives from the GoL's social objectives. Implementation of the tariff adjustment under REP I has been highly satisfactory and has helped improve EdL's financial sustainability. EdL has

continuously reported profits since 2007. Large industrial consumers from the mining and cement industries have emerged recently, and EdL has had to increase power imports from neighboring countries to supply the associated load growth. The large industrial customers were not anticipated and were not accounted for during REP I appraisal, when the tariff reform was designed. However, a review for updating the tariff structure and levels for 2009–14 is close to completion and will be initiated in 2009, with IDA allocations under both REP I and the Bank-supported Greater Mekong Subregion Power Trade Lao Project. Continued support for tariff reform is critical to sustaining improvement in EdL’s financial sustainability.

13. **Sector Financing Strategy.** As the GoL undertakes regular updating of least-cost planning scenarios and upstream development work on the most promising hydropower projects, it has also been developing and adopting new models for public-private partnership to facilitate attracting private sector financing. These efforts are expected to enhance the development of Lao PDR’s hydropower potential. In addition, the GoL has established the REF, with technical assistance under REP I, to provide subsidies, as needed, to facility private investment in off-grid renewable energy development to support rural electrification. During the implementation of REP I, IDA mobilized additional resources from ESMAP and supported capacity building of small and medium enterprises to facilitate investment in renewable energy. Continued support to productive use of electricity is critical for promotion of off-grid renewable energy use and scale-up of social benefits.

14. IDA’s ability to bring global knowledge to sector reform and facilitate capacity building for long-term sustainability of the power sector are its primary “value added” features beyond the provision of the grant. The ability to play this role derives from IDA’s deep knowledge of the Lao power sector and the relationship developed between IDA and the GoL/EdL over a decade, which merits continuation.

C. Higher-Level Objectives to Which the Project Contributes

15. **NSEDP and Country Assistance Strategy Objectives.** In supporting rural infrastructure development, which specifically targets the poor rural population and promotes sector-wide reforms and institutional capacity building, REP I and II would contribute significantly toward meeting the GoL’s NSEDP goals of reducing poverty and establishing an enabling environment for growth and development, especially in rural areas. REP II would, likewise, support the current Country Assistance Strategy (CAS) objectives of (a) sustained growth through improved management of rural and national infrastructure development and the overarching IDA goal of poverty reduction; and (b) capacity development and partnerships through strengthening of important sectoral and provincial capacities and partnerships with donors in rural electrification. REP II would also support the 2006–10 NSEDP priorities and seek, in particular, to (a) invest in such infrastructure as roads, power, and water supply, and expand access to these services; (b) invest in rural development and natural resource management, including support for agricultural, mining, forestry, and hydropower development; and (c) strengthen .

II. PROJECT DESCRIPTION

A. Lending Instrument

16. REP II is financed by the second tranche of an IDA Grant under the IDA Adaptable Program Loan (APL). The proposed IDA grant of US\$20 million, ESMAP grant of US\$0.5 million, and co-financing of US\$4.0 million from NORAD will support REP II. Complementary financing would come from contributions by EdL, MEM/REF, and consumers.

B. Program Objectives and Phases

17. The objectives of the APL Program are to: (a) increase rural households' access to electricity in villages of provinces covered by the project²; and (b) achieve sustainability of power sector development.

18. The REP has two phases with the **Phase I (2/2006 – 9/2010)** still ongoing. The **Phase II (1/2010 – 12/2013)**, to be implemented over a four-year period, will continue the same efforts that were addressed under the Phase I project, namely to support (a) investment in grid extension and off-grid renewable energy for expansion of access to electricity in rural areas; (b) implementation of actions to further improve financial performance and operation efficiency of the power sector; (c) capacity building for planning, design, implementation, and safeguard management of rural electrification and EE projects; and (d) promotion of private sector participation in sector financing and service provision.

19. **Triggers to Move from Phase I to Phase II of the IDA APL Program.** Out of the twenty four triggers for moving from the REP I to REP II, twenty triggers have been fully achieved. Of the remaining four triggers, the status is as follows: (a) one of the major trigger, the number of household connected to the grid, is on track to be achieved with 65.3 percent achieved by September 2009 vs. a 70 percent target, but the associated target of 42,000 households will not be achieved in full due to the financing gap created by price escalation during the project implementation. The proposed additional financing of US\$6.24 million using AusAID funds and extension of the IDA and GEF Grants' closing date for the REP I are in process and will provide sufficient financial resources to achieve the target; (b) one trigger, for development of a computerized Material Management and Procurement System, is considered irrelevant during project implementation and has been dropped in concurrence with IDA; and (c) two other triggers, for development of a Rural Electrification Master Plan and assessment of potential rehabilitation of existing micro hydropower schemes, are on track to be achieved by June 2010. A detailed review of the status of each trigger is presented in Table 3, Annex 3.

C. Project Development Objectives and Key Indicators

20. The development objectives of the Phase II project are to: (a) increase access to electricity of rural households in villages of project provinces; and (b) further improve the financial performance of EdL. Achievement of the project development objective would be measured by: (a) the number of households electrified; (b) the rate of return on revaluated assets of EdL, (c) EdL's account receivables from government agencies; and (d) EdL's distribution system loss (see Annex 3).

D. Project Components

21. The project will provide access to electricity to about 37,700 rural households through grid extension and off-grid electrification and bring about: (a) adequate budgetary allocations to government agencies and timely payment of electricity bills by government agencies to reduce EdL's account receivables from government agencies currently at 20 months to 3 months; (b) development and implementation of loss reduction programs that would reduce EdL's distribution system loss to less than 13 percent; (c) scale-up of the DSM and EE programs; and (d) facilitate private participation in renewable energy development following the Rural Electrification Master Plan developed under REP I, with the support of the REF.

² The project provinces are 7 southern provinces, namely: Bolikhamxay, Khammouane, Savannakhet, Saravan, Xekong, Champasak, and Attapeu for grid extension (Component A) and 17 provinces for off-grid electrification (Component B).

22. The REP II project has two components—one to be executed by each beneficiary, EdL and MEM, during 2010–13. These components are summarized below (see Annexes 4 and 5).

23. The **EdL component** will comprise the following subcomponents:

A.1. Grid Extension: (a) installation and commission of MV and LV transmission lines, transformers, and house wiring to cover about 27,700 households in the project provinces; and (b) provision of technical advisory services to EdL in project implementation and supervision, and capacity building for economic and financial evaluation, project management, and procurement.

A.2. Loss Reduction: (a) enhancement of EdL’s loss reduction efforts through the provision of goods to support the implementation of prioritize investment projects recommended by the Loss Reduction Master Plan; and (b) provision of technical advisory services to EdL for nontechnical loss reduction activities.

A.3. Information Technology System and Financial Management: Provision of technical advisory services to EdL to: (a) integrate the operation of EdL headquarters and branch offices in the project provinces by making the existing information technology system fully operational; and (b) strengthen its financial management through the information technology system, which includes computerized billing and accounting systems.

A.4. Safeguards Capacity Building: Provide goods and training to EdL and its provincial authority counterparts to strengthen their capacity in management of environmental and social assessment and impacts associated with distribution and substation projects.

A.5. Demand-Side Management and Energy Efficiency Program: Provision to EdL of: (a) goods to support the implementation of the action plan under the DSM and EE Master Plan; and (b) technical assistance to implement the action plan.

24. The **MEM component** will comprise the following subcomponents:

B.1. Off-Grid Investment Program: Application of off-grid renewable energy technologies, including solar home systems (SHSs) and pico-hydro to provide electricity to about 10,000 households in the project provinces.

B.2. Institutional Strengthening: Provision of technical advisory services to MEM to support: (a) the implementation of its comprehensive program of management; and (b) the monitoring of the performance of the outsourced management and the off-grid investment program, including provincial electrification service companies (ESCOs) and village electricity managers.

B.3. Alternative Rural Electrification Delivery Models: Provision of technical advisory services to MEM to: (a) promote alternative renewable energy development and develop associated delivery models and financing mechanisms; and (b) support small and medium enterprises in income generation that is linked to the use of the renewable energy use.

B.4. Rural Electrification Master Plan and Database: Provision of technical advisory services to MEM to: (a) maintain the rural electrification database; and (b) update the rural electrification master plan.

B.5. Organizational Strengthening of MEM: Provision of technical advisory services to MEM: (a) to support the project management unit in the implementation of Part B of the project; and (b) to establish and support the initial operation of a REFS to enable REF in its mandate.

25. The total cost of the Phase II project is estimated at US\$35.80 million, including contingencies, out of which US\$29.32 million is for the EdL component and US\$6.47 million for the MEM component. Proposed financing sources include an IDA grant of US\$20.0 million (about 55.9 percent), NORAD co-financing of US\$4.0 million (about 11.2 percent), part of an IFC loan to EdL of US\$3.88

million (10.8 percent), an ESMAP grant of US\$0.5 million (about 1.4 percent), EdL/MEM counterpart funds of US\$4.06 million (about 11.3 percent), and consumer contributions for house wiring and SHS installation of US\$3.36 million (about 9.4 percent).

26. Project design has followed the successful experience and recommendations of REP I, for which the project design was underpinned mainly by the previous IDA-supported rural electrification projects and the studies financed by the Policy and Human Resources Development Fund (PHRDF) during the preparation for the REP, including: (a) a socioeconomic survey of electrified and un-electrified villages and households; (b) a tariff study; (c) a rural electrification framework study, including review of existing off-grid delivery models and examining alternatives for scaling up off-grid electrification; (d) a study to define the overall financing strategy for the sector; and (e) a distribution system loss reduction study.

E. Lessons Learned and Reflected in the Project Design

27. The project takes into account lessons learned from the four previous Bank-supported rural electrification projects and associated studies. Key lessons and experiences learned for rural electrification *through grid extension* included the following:

- (a) Rural electrification in a country with weak capacity should be utility-driven; it can achieve rapid expansion if proper incentive mechanisms and government support are in place; and a market-driven approach can play a complementary role.
- (b) The elasticity of connection rates to upfront connection and house-wiring costs is highly negative and about 30 percent of the households—usually poor households—are unable to pay the upfront costs.
- (c) Support to the poorest group, for payment of connection charges in a simple way and with limited resources, can have a significant impact.
- (d) Large cost savings are achievable by optimizing grid extension designs.
- (e) Investments in loss reduction are very cost effective.

28. For safeguard management, the implementation of REP I suggested: (a) the application of a more flexible safeguard management; (b) more training of branch office staff, and (c) mainstreaming of safeguard requirements into EdL operations. These lessons learned and experiences are incorporated in the design of the grid -extension component under REP II.

29. The *Off-Grid Investment Program* supported by GEF under the SPRE and REP I was also very successful in achieving its objectives. The delivery model for SHSs piloted under the SPRE—reducing upfront payment by end users through a hire-and-purchase contract and undertaking marketing, planning, installation, and operation and maintenance services through five provincial ESCOs—has been refined and scaled up (to 15 provincial ESCOs covering the entire country) under REP I. This delivery model has helped achieve its objectives efficiently. Outsourcing the day-to-day management and implementation of the Off-Grid Investment Program was proven an effective arrangement to mitigate the limited staff and capacity of the DOE. The same arrangement will continue for the SHS program under REP II. Another lesson learned under REP I is that the expected private sector investment in off-grid renewable energy will not materialize if loans from banks are not available. In addition, the use of electricity from mini- and micro-hydro by rural households needs to be promoted to ensure a sufficient load factor for private investors to justify investment.

30. REP II will provide technical assistance to promote private sector participation in the development of bio-energy and mini- and micro-hydropower. In addition, ESMAP will support small

and medium enterprises to increase use of electricity for income generation. Other lessons learned under REP I include the following:

- (a) With limited DOE staff resources, implementation of the Off-Grid Investment Program needs to be outsourced.
- (b) Limited procurement capacity of the DOE can often delay project implementation and needs to be enhanced by hiring international / local procurement consultants.
- (c) Quality of services to end users cannot be timely and effectively monitored and ensured by international consultants, since frequent local travels are required to reach the mass of end users in remote villages.
- (d) Continued support to the DOE for financial management is needed, and qualified local consultants are available.
- (e) Unexpected price escalation can create significant cost overruns and jeopardize the achievement of project objectives.
- (f) REP I safeguard performance suggested that there were no impacts because of SHSs, but measures to enhance safety should be considered for pico-hydro. This concern has been incorporated in REP II.

31. Important lessons from similar projects in Cambodia, Chile, Ethiopia, and Swaziland, reflected in the design of REP I Off-grid Investment Program, include the following:

- (a) To ensure institutional and financial sustainability, rural energy programs must maximize private sector participation.
- (b) To achieve impacts on living standards, an integrated approach linking rural electrification services with livelihood support and income-generating activities should be taken.
- (c) The most critical role for government is to put in place a sound regulatory framework, an adequate tariff structure, and a dedicated rural electrification agency that can look after mobilization of concessionary financing.
- (d) A rural electrification program should be an integral part of the overall power sector development strategy.³

F. Alternatives Considered and Reasons for Rejection

32. The Phase II project was predefined as part of the APL Program. The APL approach was chosen rather than a Specific Investment Loan because the APL approach would accommodate both the current severe constraints on IDA funds and the long time span necessary to implement substantive sector reforms in a consensus-based political environment. Scaling up the off-grid renewable energy supply with new business models and alternative service providers would also require the long-term support of IDA. The APL approach would enable IDA to provide support in a flexible manner—providing future support when the project-supported investment and reform activities have sufficiently advanced. The milestones of these reform activities to be reached to receive further IDA support are proposed as triggers for Phase II of the APL Program. To achieve the project development objectives, the alternatives to be considered include electrification of all the targeted households through grid extension. Because of the remoteness and sparse distribution of some of the households and the associated cost of electrification through grid extension, which is projected to be high, a hybrid solution comprising grid extension and off-grid electrification programs is selected to achieve the objectives.

³ *A Review of the ESMAP Rural Energy and Renewable Energy Portfolio*, April 2004, a joint United Nations Development Programme/ESMAP Publication.

III. IMPLEMENTATION

A. Partnership Arrangements

33. In power sector development in the Lao PDR, the **GEF** and **NORAD** have been close partners in SPRE and the REP, while the **PHRD** has financed a host of studies underpinning both. **ESMAP** financed a 1999 study, Institutional Development for Off-Grid Electrification, and the Asia Sustainable and Alternative Energy Program (**ASTAE**) provided assistance in project definition and supervision of PHRD-financed studies. **ADB** is financing rural electrification activities in the northern provinces, while IDA is covering the southern provinces.⁴ The ADB and IDA jointly supported the financial recovery plan for EdL and financed complementary sector reform technical assistance. The Japan International Cooperation Agency (**JICA**) financed several studies—notably the Transmission and Distribution Master Plan and the Feasibility for Hydropower Based Mini Grids—both of which would underpin the Rural Electrification (APL) Program. Moreover, the Japan Bank for International Cooperation (**JBIC**), in association with JICA, has financed a 115 kV line, which would partially facilitate REP II of the APL Program. **Private companies** for off-grid service have been consulted in formulating off-grid rural electrification arrangements for the project. **AusAID** has provided additional financing to REP I to fill in the financing gap from price escalation, to support 11,500 rural households to be connected to the grid and 5,000 rural households to be provided with SHSs, and to scale up the impact of the grid extension project with a Power to the Poor Program, which is critical for reaching the poorest rural households in the targeted villages. Power to the Poor was designed to provide interest-free credit to the poorest rural households and to rural households headed by women that could not afford the upfront charges for connection to the grid. The program was piloted under REP I, with IDA and GEF resources and technical assistance under the IDA-supported Gender Action Plan (**GAP**). It will be scaled up with IDA resources under REP II, together with the AusAID additional financing to REP I.

34. For REP II, NORAD will finance the technical assistance activities critical to implementation of both the EdL and MEM components and development of the power sector. NORAD-financed activities will also contribute to laying the foundations for a more sustainable approach to rural electrification and DSM/EE in the long term and support organizational development, capacity building, and institutional arrangements that would overcome the barriers to achieving global environmental benefits.

35. In addition, EdL has signed a Mandate Letter with **IFC** for processing a loan of US\$15.0 million to finance additional grid extension subprojects. Part of the loan proceeds (US\$3.88 million) will be used for construction and installation of IDA-funded grid extension subprojects. MEM is also applying an IFC advisory service of about US\$0.35 million in partnership with an ESMAP grant of US\$0.5 million to promote private investment in renewable energy projects and promote the productive uses of electricity for income generation. Since REP II will be a logical follow-up to its predecessor REP I, **GEF** will continue to support the development of off-grid renewable energy and promotion of DSM and EE, through a separate project under processing in parallel. All these activities will be implemented in a coordinated approach.

B. Institutional and Implementation Arrangements

36. **Implementation Period.** REP II will be implemented over four years, beginning in January 2010 and ending in December 2013.

⁴ The off-grid and district hydropower schemes under REP I target the entire country.

37. **Implementing Agencies.** The project would be implemented jointly by EdL and MEM. The same EdL Project Office for REP I will be responsible for implementation of the EdL component of REP II and for overseeing the implementation of individual physical subprojects by EdL's branch offices in the seven central and southern provinces. The same MEM project management unit for REP I will also be responsible for implementing the MEM component of REP II. Implementation and management of the off-grid investment programs will be outsourced because of the limited staff and capacity of the DOE. As part of the capacity building program under REP I, local consultants have developed adequate capacity to assist the DOE in managing the Off-Grid Investment Program developed under the SPRE and REP I. Both international and local consultants will be hired to support the initial operation of the REFS and to provide training to the REF Staff.

38. **Procurement Capacity.** Ed L has gained some experience with IDA-financed procurement. MEM has gained substantial experience and knowledge in IDA-financed procurement under REP I. However, shortage in procurement capacity was still a bottleneck for smooth and timely implementation of REP I. Two new MEM project management unit staff members were appointed for procurement. An international procurement consultant will be hired to assist the MEM project management unit in procurement under REP II and to provide on-the-job training to the MEM staff. The task team will also provide training on IDA's procurement procedures for capacity building in the long term.

39. **Financial Management Capacity.** EdL is familiar with IDA financial management and disbursement procedures, but will still need support in internal and external auditing. Technical assistance will be provided to enhance the capacity of EdL's Internal Audit Department. MEM has tracked and monitored the financial transactions of REP I by using an accounting program developed in-house, which has served the requirements of REP I. With REP I, MEM gained knowledge of and experience with IDA disbursement procedures. MEM has appointed a financial management staff for REP II, and training for financial management will be provided to the staff. An experienced individual consultant will be hired to assist the project management unit in financial management.

40. **Safeguard Capacity.** The Environmental Office at EdL's headquarters has gained some capacity in environmental and social impacts mitigation through the safeguard capacity building programs under the SPRE and REP I. However, the branch offices of EdL have limited capacity in safeguard management associated with grid extension subprojects. The safeguard capacity building program under REP II will focus on capacity building to forge effective implementation of the Environment and Social Policy Frameworks (ESSFs), especially in the branch offices. The SHS activity, which is the major part of the off-grid investment program of both REP I and II, has few negative environmental and social impacts. However, MEM has limited capacity in associated safeguard management for the potential mini- and micro-hydro, biomass, and biogas projects expected to be promoted under REP II. To meet the medium- and long-term needs for capacity building on safeguards, a safeguard capacity building program for MEM and EdL has been developed and will be implemented under the IDA- and AusAID-financed Technical Capacity Building in the Mining and Hydropower Sectors Project.

41. **Funds Flow.** An IDA grant will be provided to the GoL. The grant proceeds made available to EdL will comprise 80 percent in a subgrant and 20 percent in a loan comparable to IBRD terms and conditions—the same as those for REP I. The grant proceeds made available to MEM would be transferred to MEM in a subgrant. Disbursement of the IDA grant will be made using the same system established under REP I. Grant proceeds will be disbursed either to EdL and MEM through designated accounts or to suppliers and consultants through direct payments. EdL counterpart funds will be channeled through normal EdL payment procedures. The GoL (MEM) counterpart funds will be mobilized from the REF to co-finance the MEM component. Consumer contributions will be direct

payment to contractors for either house wiring for using grid electricity and installation of SHSs under the Off-Grid Investment Program.

C. Monitoring and Evaluation of Outcomes and Results

42. Comprehensive M&E arrangements, including key performance indicators and data collection and reporting arrangements, were agreed with MEM and EdL (see Table 2 in Annex 3). Baseline for the agreed key performance indicators has been established. MEM and EdL will be responsible for data collection and reporting following the agreed time frame and their performance for data collection and reporting under REP I is satisfactory. A comprehensive assessment of results and outcomes will be conducted by MEM and EdL by the project completion and recorded in a Project Completion Report. The Bank will conduct regular supervision missions twice a year to check the project implementation progress and the outputs and assess realism of the expected results and outcomes, and a mission shortly after project completion to assess the final outputs and outcomes together with MEM and EdL.

D. Sustainability and Replicability

43. **Sustainability of the Off-Grid Investment Program.** The SHS delivery model developed over the SPRE and REP I has proven its sustainability by providing electricity to almost 15,000 households over the past decade. With support of the NORAD-, AusAID-, and ESMAP-financed technical assistance, REP II includes features that will further improve sustainability of off-grid electrification in the Lao PDR and other countries: (a) developing and maintaining a self-sustaining REF to provide subsidies to off-grid electrification; (b) outsourcing the implementation of the Off-Grid Investment Program through a performance-based management contract to ensure operational effectiveness, customer services, diversification of technologies, and collection of repayments; and (c) providing continued technical assistance to MEM to enable it to focus on other important functions, such as regulation of rural electrification, management of the REF, off-grid electrification planning integrated with grid-extension planning, and supervision of the management contract execution.

44. **Sustainability of the Grid Extension Component.** It was proven that the grid extension investment under the SPRE and REP I was based on sound and cost-effective technology. The sustainability of the grid-extension electrification depends mainly on: (a) a tariff structure and levels to ensure affordability of rural households and cost recovery of electricity supply; and (b) a sound financial position of EdL. Tariff reform since 2005 has been highly satisfactory. EdL's financial position has been enhanced remarkably with the implementation of the Sustainability Action Plan (2005–2011) under REP I, and further enhancement is expected through continued tariff adjustment, technical assistance and EdL's regular investments in system loss reduction, and settlement of government arrears in line with the plan under REP II.

45. **Sustainability of the DSM and EE Component.** DSM and EE are new concepts in the Lao PDR. Moreover, historically low electricity tariffs have made EE a relatively unattractive investment. To ensure the sustainability of this component, an incremental approach was taken. REP I was designed to lay the foundations for EE by creating public awareness, building institutional capacity, and creating early interest through small pilot projects in government buildings. With technical assistance under REP I, a DSM cell within EdL was established and a Master Plan for DSM and EE developed. REP II will take further steps for capacity building of the DSM cell, implementation of the Master Plan, and broadening EE programs to include other consuming sectors (for example, households).

46. **Replicability.** The design of both grid extension and off-grid investment activities is already an amalgam of rural electrification programs in Bangladesh, Chile, the Lao PDR, and elsewhere. In Asia, it is very important that the innovation in a basic framework for off-grid electrification programs is

undertaken within a national grid extension and off-grid rural electrification program, where renewable energy plays a critical role and financing is from concessionary and other sources coordinated by a REF. Other countries likely to benefit from variants of this model include Cambodia, Bangladesh, Nepal, and Papua New Guinea. Key elements of the replication approach include: (a) a knowledge management activity to document key aspects; (b) an outreach and information dissemination effort; (c) documentation and dissemination of key features of REP, especially the outsourcing process, integrated rural electrification planning, and the REF; (d) bilateral and regional experts' forum on sustainable and renewable rural electrification; and (e) replication of innovative activities under the REP beyond the region with ESMAP support.

E. Critical Risks and Possible Controversial Aspects

47. REP II was built on the lessons and successful experiences of SPRE, REP I, and other rural electrification projects in the region. The major risks that may affect achievement of the project outputs and impacts are summarized in Table 1 below. No major controversial issues and reputation risks for IDA are expected.

Table 1: Risks and Mitigation Measures under REP II

<i>Risks</i>	<i>Rating</i>	<i>Risk mitigation measures</i>	<i>Rating with mitigation</i>
To project development objectives			
Targeted number of households for electrification may not be achieved because of cost overruns.	M	<ul style="list-style-type: none"> - Using the latest price information for cost estimation. - Being moderate in setting targets. - Making aggressive efforts to replicate the Power to the Poor program. 	L
Delays in verification and settlement of government accounts receivables because of budget shortfalls.	M	<ul style="list-style-type: none"> - Continued implementation and close monitoring of the Sustainability Action Plan. - Coordinated review with all the key government agencies under various Bank- and donor-funded projects. 	L
To component results			
Limited staff and capacity of the DOE to manage the operation and maintenance of the existing off-grid program and implementation of the new off-grid program under REP II.	M	<ul style="list-style-type: none"> - Continuing hiring the established provincial ESCOs with adequate capacity and satisfactory performance proved under REP I to manage the operation and maintenance of the existing Off-Grid Investment Program and implementation of the Off-Grid Investment Program under REP II. - Continuing training of the provincial ESCOs for capacity building. - Close supervision and support by the Bank task team. 	L
General weak procurement environment in the country. Procurement delays particularly because of the DOE's weak procurement capacity.	S	<ul style="list-style-type: none"> - Practically all procurement financed by IDA will be procured through International Competitive Bidding (ICB); the nature of procurement generally requires goods supplied from abroad through international suppliers. - An international procurement consultant is being engaged by the DOE to assist in procurement and build capacity of MEM staff. 	M
Limited financial management capacity of the DOE for the Off-Grid Investment Program.	S	<ul style="list-style-type: none"> - Continuing to hire experienced financial management consultant. - Training of the DOE's designated financial management staff. - External auditing, as included in the auditing bundling exercise. - Close supervision by the Bank task team. 	M
Weak safeguard management capacity at EdL's branch offices.	M	<ul style="list-style-type: none"> - Systematic training programs targeting the teams at the branch offices to be implemented under a parallel Bank-funded technical assistance project. - Complementary training program to be implemented under REP II. - Close supervision by the Bank task team. 	L
Limited capacity to implement safeguard measures (ESSF) on the ground.	M	<ul style="list-style-type: none"> - The Environmental Office to provide periodic training on the implementation of the ESSF, including the Resettlement Policy Framework and Ethnic Group Development Framework, to branch offices 	L
Overall risk (including reputational risks)	S		M

Note: Risk Rating—H (High Risk), S (Substantial Risk), M (Moderate Risk), N (Negligible or Low Risk).

F. Loan and Credit Conditions and Covenants

48. The agreed conditions for effectiveness and covenants are as follows:

- (a) **Effectiveness condition.** (i) The Subsidiary Agreement has been executed on behalf of the Recipient and the Project Implementing Agency; (ii) NORAD's written confirmation to the Recipient and the Association that all internal approvals have been obtained for NORAD to make available the Co-financing; and (iii) the REF Manual has been adopted by the Recipient.
- (b) **Flow and Utilization of Project Funds.** Proceeds of the IDA grant made available to EdL will consist of 80 percent in sub-grant and 20 percent in a loan comparable to IBRD terms and conditions.
- (c) **Implementation covenants.** MEM shall maintain a financial management system, including a computerized accounting system to support Project accounting activities, acceptable to the Bank. EdL and MEM shall submit to the Bank within the agreed timeframe: (i) semi-annual project progress reports; (ii) quarterly financial management reports; (iii) annual project-account audit reports; and (iv) a project completion report.
- (d) **Safeguard Aspects.** EdL and MEM shall implement the agreed ESSFs for both grid extension and off-grid investment activities.
- (e) **Financial Aspects.** Implement the Sustainability Action Plan as agreed, to adjust tariff and off-set existing and future government account receivables. Financial covenants include: (i) maintaining a self-financing ratio of no less than 15 percent of three-year average planned capital expenditures; (ii) maintaining net revenues of no less than 1.3 times annual projected debt service payments; and (iii) maintaining the ratio of its long-term debt to no more than 1.5 times its equity.

IV. APPRAISAL SUMMARY

A. Economic and Financial Analyses

49. **Summary Economic Analysis** (see Annex 9). At a 10 percent discount rate, the economic benefit for the grid extension component is estimated at a net present value (NPV) of US\$84.49 million. For the off-grid SHSs, the economic benefit per SHS ranges from the NPV of about US\$209 to US\$313, depending on the size of the system (see Table 2 below).

Table 2: Economic Benefit of Solar Home Systems

	NPV (US\$)	Benefit/cost ratio	Economic internal rate of return (%)
Grid Connection	84.49 million	2.80	80.77
Off-Grid SHS			
20 Wp System	253.71 per SHS	1.84	41
30 Wp System	209.06 per SHS	1.55	23
40 Wp System	268.30 per SHS	1.59	22
50 Wp System	313.58 per SHS	1.61	22

50. **Summary Financial Analysis** (see Annex 9). Financial analysis for the grid extension component reveals that under the current subsidy arrangement and tariff regime, the grid extension component will have a NPV of US\$4.39 million at a 10 percent discount rate, and the off-grid investment subcomponent, ranging from US\$43.77 to US\$200.13 per SHS (see Table 3).

Table 3: Summary Financial Analysis

		<i>NPV (US\$)</i>	<i>Benefit/cost ratio</i>	<i>Financial internal rate of return (%)</i>
Grid Connection	With capital subsidy	4.39 million	1.14	14.8
Off-Grid (SHS)	20 Wp System with 100% capital subsidy	43.77 per SHS	1.51	-14
	30 Wp System with 100% capital subsidy	90.14 per SHS	2.05	-29
	40 Wp System with 100% capital subsidy	148.89 per SHS	2.82	-62
	50 Wp System with 100% capital subsidy	200.13 per SHS	3.34	N/A

51. Recognizing the importance of rural electrification in poverty reduction and social development in rural areas (see Annex 9) and the fact that rural households are paying less than cost recovery for electricity supply, the government will provide 80 percent of the IDA grant proceeds to EdL in the form of a grant to subsidize the capital cost of the grid extension component and allow EdL to keep dividends from export hydropower plants to subsidize its operation cost. The Sustainability Action Plan, including a tariff adjustment over the period 2005–11 under implementation now is designed to gradually phase out EdL’s reliance on the dividends by the end of REP in 2011. Review and update of the tariff adjustment is under way, and the updated tariff adjustment will be implemented when it is ready. For the IDA-supported Off-Grid Investment Program, the government will provide the funds—100 percent in the form of a grant—for the capital cost and customer repayments will be sufficient to cover operating and maintenance costs. The significant differences between the economic and financial returns of the grid extension and off-grid rural electrification are largely a result of the high consumer surpluses calculated based on lighting intensity (see Annex 9).⁵

52. **EdL’s Current Financial Situation.** EdL’s financial situation has been remarkably improved under REP I as a result of the implementation of the Sustainability Action Plan. The actions implemented allowed EdL to turn increased profit in both 2007 and 2008. Four key actions under the plan are: (a) an annual tariff adjustment during the period 2006–10; (b) settlement of arrears by government agencies; (c) EdL’s system loss reduction; and (d) creation of awareness and practice of DSM and EE. Annual tariff adjustments have been implemented as planned. Verification of arrears owed by government agencies is ongoing and settlement of verified arrears has been on schedule. In addition, new arrears were being reduced because of increased budget for electricity bills and improved discipline on use of the budget. Settlement of government arrears is the subject of intensive dialogue between IDA and the government under the Bank’s annual reviews of its budgetary support to the GoL through the Poverty Reduction Support Operations and regular supervision of REP I and Greater Mekong Subregion Power Trade Lao Project. Distribution system losses were reduced from more than 20 percent in 2005 to about 13 percent in 2009. Tariff adjustment, settlement of arrears, and a significant reduction in system losses have resulted in an improved financial performance of EdL.

B. Technical

53. **Grid Extension.** The design conforms to best practices for network development. EdL’s designs and construction practices, evolved with international consulting assistance, provide the balance between technical performance and costs. Network configurations are tailored to load characteristics, and adopt 22 kV (MV) lines of three-phase, two-phase, single-phase, and single-wire-earth-return systems (SWER). 415 V (LV) network is optimized in regard to sizing of transformers and line phasing.

54. **Loss Reduction.** State-of-the-art software and hardware and project evaluation methodologies for reducing technical losses have been employed during REP I. Adequate international consulting assistance will be engaged to provide technical assistance for commercial losses reduction.

⁵ For each kilo-lumen hour for lighting, consumers are paying 3.32 kip with grid electricity, and most (63 percent) of the rural households without access to grid electricity are paying more than LAK 4,600 with candles and diesel lamps.

55. **Off-Grid Program.** Proven technologies and delivery models for SHSs and mini- or micro-hydro schemes would be employed and international consulting services for preparation of biomass generation provided for the off-grid electrification.

C. **Fiduciary**

56. **Procurements.** The majority of the procurement would be done through ICB procedures. The Procurement Plan prepared by EdL and MEM is satisfactory. Bidding documents for all ICB packages under REP I could be directly used for REP II, with slight changes, for example, in dates and quantities.

57. IDA's procurement capacity assessment report is in the project file. Although EdL has good experience in carrying out procurement, MEM has limited ICB capacity. To address the weak procurement capacity of MEM, external assistance will be provided, with: (a) an international procurement consultant to assist MEM to prepare ICB bidding documents and manage the procurement work; (b) training on English and procurement to the two designated procurement staff with an engineering background; and (c) close supervision and support by the procurement specialists of the Bank. With these arrangements, the overall procurement risk is rated as "average."

58. **Financial Management.** The financial management assessment indicated an inherent high-risk environment for the project implementation. For REP II, the same financial management and disbursement arrangements as those under REP I will be applied, which have been assessed as adequate. REP I has been regularly supervised by the Bank and the financial management performance has been marginally satisfactory (see details in Annex 7), mainly because of delays in submission of Interim Financial Reports and Audit Reports. Appropriate mitigation measures have been incorporated that will reduce the residual risks of the project from "substantial" to "moderate," including the following:

- (a) The financial management consultant currently engaged by the DOE will continue to be engaged to assist in day-to-day operations of all financial management aspects.
- (b) An independent auditor will be engaged to conduct the audit of the project's financial statements.

59. Financial management of the project would be handled by EdL and MEM for their respective components, which would ensure a separate flow of funds, reporting, monitoring, and tracking of funds usage. EdL project accounting would be automated by the Accounting and Financial Management System. MEM project accounting would be automated by an in-house accounting program using Access software. Separate Interim Financial Reports will be prepared by EdL and MEM and submitted to IDA within 45 days of the end of each quarter. EdL will finance the audit fees from its own source for both the corporate and the project financial statements for EdL component. The audit of the MEM component will be included in the audit bundling exercise currently being carried out by the Ministry of Finance (MOF). All audit reports would be submitted to IDA within six months after the end of each fiscal year.

D. **Social**

60. As occurred in REP I, the REP II project generally is expected to yield positive social benefits to the rural population, since improved access to electricity in rural areas leads to improved living standards and greater opportunity for income generation. Because physical works are very small in scale, significant adverse social impacts are not anticipated. Because the project may involve ethnic minority communities, and may require very minor land acquisition or restrictions on land use, the Indigenous Peoples policy (OP/BP 4.10) and the Involuntary Resettlement policy (OP/BP 4.12) are

triggered. Given the implementing experience under REP I, the social safeguard requirements for REP II were reviewed and revised. A social safeguard screening process has been included in the ESSF, which includes a revised Resettlement Policy Framework and Ethnic Group Development Framework. Key elements of these documents incorporated within the ESSF are highlighted in Annex 10. Bank supervision will confirm effectiveness of this approach.

E. Environment

61. Similar to REP I, negative environmental impacts are not anticipated. Only the Environment Assessment policy (OP/BP 4.01) was triggered and REP II was assigned as category “B”. Experience gained during the implementation of REP I suggests that implementation of the grid-extension subprojects would involve small-scale civil works and that negative impacts on the local environment during construction would be temporary and localized, and could be mitigated by good engineering practices. EdL proposes to apply good engineering practices and an effective safeguard screening process and to continue training of EdL staff, especially those in the branch offices. EdL also prepared an ESSF, including the Resettlement Policy Framework and the Ethnic Group Development Framework, for the EdL component, and it will be applied to all the grid extension subprojects. Execution of the MEM component for off-grid electrification using the SHSs carried out under REP I, does not create any negative environmental impacts. However, given that other alternative technologies (such as pico-hydro, household biogas, village hydro, and village biomass) may be conducted under other funding sources, the DOE and MEM prepared an ESSF, including an Ethnic Group Development Framework and Ethnic Group Development Framework, for the off-grid subprojects to ensure that adverse impacts will not occur or will be adequately mitigated. More details on these two ESSFs is provided in Annex 10.

F. Safeguard Policies

Table 4: Safeguard Policies

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP 4.01)	[X]	[]
Natural Habitats (OP/BP 4.04)	[]	[X]
Pest Management (OP 4.09)	[]	[X]
Physical Cultural Resources (OP/BP 4.11)	[]	[X]
Involuntary Resettlement (OP/BP 4.12)	[X]	[]
Indigenous Peoples (OP/BP 4.10)	[X]	[]
Forests (OP/BP 4.36)	[]	[X]
Safety of Dams (OP/BP 4.37)	[]	[X]
Projects in Disputed Areas (OP/BP 7.60)*	[]	[X]
Projects on International Waterways (OP/BP 7.50)	[]	[X]

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas.

G. Policy Exceptions and Readiness

62. The project is in compliance with IDA policies and procedures without policy exceptions. It meets readiness criteria for implementation.

Annex 1: Country and Sector Background

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in support of the Rural Electrification (APL) Program

A. General

1. The Lao People's Democratic Republic is a small, landlocked nation of 5.9 million people at the center of the dynamic Mekong region. The country is facing numerous development challenges, but has been undertaking reforms that are helping it embark on an increasingly sustainable development path. With strong economic performance and structural reforms in trade, private sector development, and public financial management, the Lao PDR is fighting poverty, addressing social inequities, and building stronger capacity to manage its rich natural resources.

2. Through its National Socio-Economic Development Plan, the country's poverty reduction plan), the GoL has laid out its objectives of: (a) sustaining economic growth; (b) accelerating efforts to reduce poverty; (c) protecting the country's environmental resources; and (d) promoting industrialization and modernization. The World Bank is working with the GoL to support these efforts, along with the country's goal of exiting Least Developed Country status by 2020.

3. The Lao PDR has been growing at a rate of 6.5 percent a year since 2001, and reached 7.6 percent growth in 2006. This growth is associated mostly with increased foreign direct investment (FDI) in the hydropower and mining sectors. GDP growth is projected to slow at between 5 and 7 percent in 2009, as a result of the financial turmoil and the global economic downturn. However, growth is expected to remain fairly strong, driven by new outputs from ongoing mining and hydropower projects, as well as agro and processing industries, construction, and other services. Poverty rates have been on the decline, with the number of poor households falling from 46 percent of the total in 1992/93 to approximately 33 percent in 2002/03 and 31 percent in 2005.

B. Sectoral Context

4. The Lao PDR has huge hydropower resources. Technical hydropower potential is estimated at 26,500 MW with about 23,000 potentially exploitable (18,000 MW excluding mainstream Mekong). Only a tiny fraction has been developed so far; about 3 percent (699 MW) is now in operation (see Table 1-1) and 11 percent is under construction (including Nam Theun 2), as shown in Table 1-2. Hydro energy provides substantial revenues from exports to neighboring countries and 98 percent of the current country's generation needs. Most hydro energy is exported to Thailand, while imports cover islanded grids and supply some of EdL's grids in peak hours. Domestic power demand grows and depends on the capacity of the grid, which is a bottleneck to the rapid growth of electrification. In contrast, exports are expected to decline in the short term because of the global crisis.

Table 1-1: Power Generation in the Lao PDR

Name	Location	Commissioning	Capacity (MW)	Market	Ownership
Nam Ngum 1	Vientiane	1971	155	Domestic	GoL/EdL
Xeset 1	Saravan	1991	45	Domestic	GoL/EdL
Theun-Hinboun	Bolikhamxay	1998	210	Export	IPP
Houay Ho	Champasak / Attapeu	1999	150	Export	IPP

Name	Location	Commissioning	Capacity (MW)	Market	Ownership
Nam Leuk	Vientiane	2000	60	Domestic	GoL/EdL
Nam Mang 3	Vientiane	2005	40	Domestic	GoL/EdL
Selabam	Champasak	1961	5.04	Domestic	GoL/EdL
Nam Ko	Oudomxay	1996	1.5	Domestic	GoL/EdL
Nam Dong	Luangprabang	1961	1	Domestic	GoL/EdL
Nam Ngai		2006	1.2	Domestic	GoL/EdL
Nam Tha		2006	1.25	Domestic	GoL/EdL
Mini and micro-hydro	37 locations		11.5	Domestic	Provincial Gov.
Diesel generators			17.5	Domestic	Provincial Gov.
Total			699.0		

Source: Electricité du Laos and MEM, 2006.

Note: IPP stands for independent power producer.

Table 1-2: Power Projects under Construction in the Lao PDR

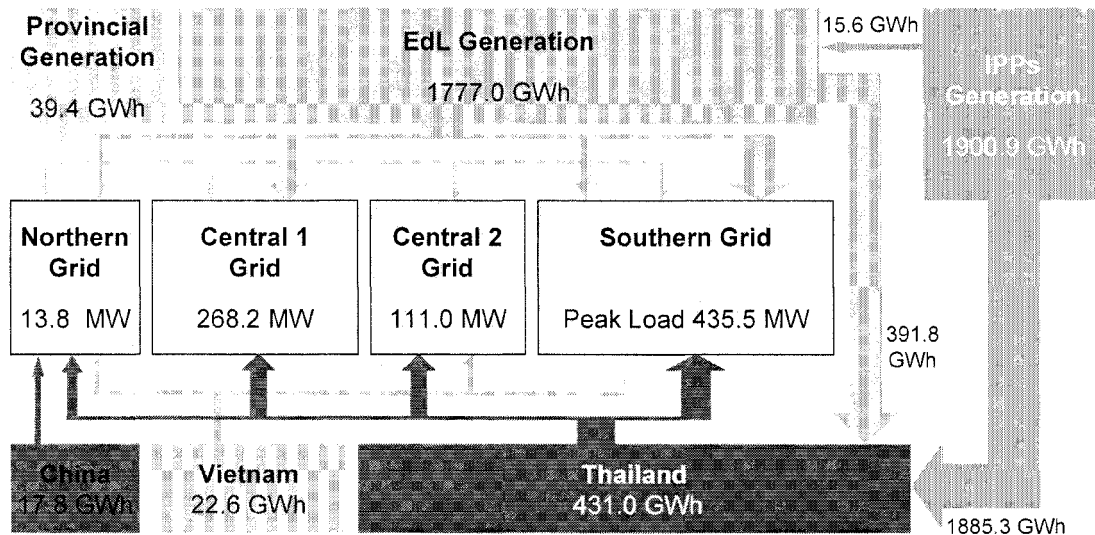
Name	Location	Comm.	Capacity (MW)	Market	Progress (%)
Nam Lik 1–2 (IPP)	Vientiane	2010	100	Domestic	26
Nam Ngum 2 (IPP)	Vientiane	2013	615	Export	67
Nam Nhone	Bokeo/Luangnamtha	2009	2.4	Domestic	N.A.
Nam Ngum 5 (IPP)	Vientiane/Xiangkouang	2011	120	Domestic	10
Nam Theun 2 (IPP)	Khammouane	2009	1,088	Export/Domestic	95
Xeset 2 (EdL)	Saravane	2009	76	Domestic/Export	85
Theun-Hinboun Expansion (IPP)	Bolikhamsay	2012	300	Export/Domestic	N.A.
Xekaman 3 (IPP)	Sekong	2010	250	Export/Domestic	64
Tatsalen (IPP)		2010	3	Export	N.A.
Total			2,554		

Source: and MEM, 2007.

5. Domestic electricity consumption in 2007 was 2,200 GWh with 400 MW peak demand, and the electrification rate was 61 percent. It is expected that consumption will more than double by the year 2020, provided no large power-consuming industrialization takes place, such as alumina refining and aluminum smelting. More than 75 percent of the domestic demand is in the central region.

6. There are four sub-grids—Northern Grid, Central Grid 1, Central Grid 2, and Southern Grid—in the country that are not interconnected, but are all connected to the Thai grid (see Figure 1-1, below). Because of the domination of hydropower (more than 98 percent) in the country's power generation mix, EdL, the state-owned power utility company, regularly imports electricity from Thailand to meet domestic demand when there is a shortage of supply, especially in dry seasons. In addition, an electricity supply deficit in one of EdL's sub-grids may need to be filled by surplus in another, through import from or export to Thailand for wheeling of the power. Several projects funded by ADB, World Bank, and JICA are currently in the process of integrating these four grids into one national grid, but this will not happen in the short term. A bigger grid would provide more stability to the expected upcoming load. And moreover, the ongoing regional power trade programs supported by ADB and the Bank would support the flow of energy from or to the Lao PDR and across the region.

Figure 1-1: Lao PDR Power Sector Production Flow Diagram, 2008



Note: Imports values from China and Vietnam correspond to EdL. Figures for imports by Provincial Authorities are not available.

Source: Electricité du Laos. 2009.

7. Grid extension to expand access to electricity in the country is another sector priority of the government. The government's aim is to reach 70 percent of Lao PDR households by the year 2010, 80 percent by 2015, and 90 percent by 2020. The access rate has been growing rapidly from about 16 percent in 1995 to 63 percent in June 2009. The ADB and Bank have been funding the rural electrification programs in the country since early 1990s. Recently other donors, such as NORAD and AusAID, have provided resources to expedite the rural electrification process.

8. The "Power Sector Policy Statement" issued in 2001 sets out the GoL's four policy goals: (a) maintain and expand an affordable, reliable, and sustainable electricity supply in the Lao PDR to promote economic and social development; (b) promote hydropower exports to earn revenues to meet the GoL's development objectives; (c) enhance the legal and regulatory framework to underpin power sector development; and (d) strengthen institutional structures, clarify responsibilities, streamline administration, and foster commercialization. It also prioritizes the following activities: (a) expand electrification; (b) complete commercialization of EdL; and (c) develop a financing strategy for domestic and export power developments.

C. Power System Development Planning⁶

9. Table 1-3 depicts consumption growth and Table 1-4 shows historical peak loads in the four non-interconnected area load centers—Central 1, Central 2, Southern, and Northern. Growth for the Lao PDR averaged at close to 15 percent per year over the past 14 years, with particularly dramatic increases in the central-south area as a result of household electrification, irrigation pumping, and commercial and industrial consumers. Electricity consumption in the North, which has historically lagged behind in electrification in the past, has also accelerated at a very high growth rate at 44 percent. This is primarily a result of aggressive grid expansion. Each load center has strong cross-border interconnections and nearby sources of hydropower. Over the time frame of REP, the centers would remain unconnected, and EdL's power development planning would continue on a regional rather than on a national basis.

⁶ Power Development Plan (PDP 2007-2016), March 2008, EdL.

**Table 1-3: Historical Energy Consumption
(GWh)**

Year	Northern	Growth (%)	Central 1	Growth (%)	Central 2	Growth (%)	Southern	Growth (%)	All Laos	Growth (%)
1994			213	5.97	45	18.42	21	16.67	279	8.56
1995			259	21.60	53	17.78	25	19.05	338	21.15
1996	1		288	11.20	62	16.98	29	16.00	380	12.43
1997	2.8	180.00	323	12.15	72	16.13	36	24.14	434	14.21
1998	4.4	57.14	375	16.10	87	20.83	48	33.33	515	18.66
1999	5.5	25.00	402	7.20	102	17.24	57	18.75	567	10.10
2000	7	27.27	457	13.68	114	11.76	62	8.77	649	14.46
2001	8.5	21.43	512	12.04	120	5.26	70	12.90	728	12.17
2002	12.3	44.71	550	7.42	126	5.00	79	12.86	785	7.83
2003	15.2	23.58	638	16.00	141	11.90	90	13.92	906	15.41
2004	16.2	6.58	647	1.41	142	0.71	98	8.89	903	-0.33
2005	20.5	26.54	729	12.67	157	10.56	104	6.12	1011	11.96
2006	26	26.83	795	9.05	464	195.54	116	11.54	1401	38.58
2007	44	69.23	907	14.09	525	13.15	141	21.55	1617	15.42
2008	52	18.18	1141	25.80	223	-57.52	162	14.89	1578	-2.41
Average growth		43.87		12.43		20.25		4.60		13.21

**Table 1-4: Historical Peak Loads
(MW)**

Area	1999	2000	2001	2002	2003	2004	2005	2006	Growth rate, 1999-2006 (%)
Northern	2.85	3.78	4.44	6.36	7.01	7.06	8.27	12.78	23.8
Central 1	102.46	118.17	129.6	137.99	164.49	175.66	213	217.01	11.3
Central 2	25.54	29.42	32.57	32.33	35.29	39.51	40.04	83.6	18.5
Southern	15.94	17.29	19.75	22.01	24.59	26.78	30	36.86	12.7
Country	146.79	168.66	186.36	198.69	231.38	249.01	291.31	350.25	13.2

Source: Electricité du Laos and MEM, 2008.

10. Table 1-5 shows recent patterns of production, consumption, and cross-border exchanges. In 2006 EdL hydropower stations generated about 1,639 GWh, which is expected to increase to 1,823 GWh with the addition of Nam Theun 2 and Xeset 2 in 2009. Year-to-year variations are considerable, however, as shown by the sharp downturn in 2003. A 12 percent growth in domestic consumption, together with expected growth of imports needed to balance regional supply and demand, would result in the cross-border balance of trade switching to a net import of energy in 2013 (this excludes the significant exports from the new independent power producers (IPPs)).

11. The Nam Theun 2 hydropower plant will represent a substantial expansion of the Lao PDR's independent power producer operations with its capacity of 1,070 MW, which will become operational in 2009. Other expansions and green-field development of hydro sites are expected to further increase independent power producer operations over the next decade. This is also expected to affect EdL's operational strategy, since domestic off-take from large-scale independent power producers will present a cost-effective alternative to EdL's own development of more expensive medium-size hydro sites.

Table 1-5: Historical Generation, Imports, Exports, and Consumption

Year	Generation		Imports		Exports		Consumption	
	GWh	Growth (%)	GWh	Growth (%)	GWh	Growth (%)	GWh	Growth (%)
1995	1,085	-9	76.8	34	675.4	-19	337.5	20.8
1996	1,248	15	87.6	14	792.4	17	379.9	12.5
1997	1,219	-2	101.6	16	710.2	-10	434.1	14.3
1998	947.8	-22	142.3	40	405.2	-43	514.6	18.5
1999	1,169	23	173.4	22	598.1	48	567	10.2
2000	1,578	35	162.6	-6	862.9	44	648.7	14.4
2001	1,554	-2	185.2	14	796.4	-8	728	12.1
2002	1,570	1	200.8	8	771.4	-3	785.4	8.0
2003	1,317	-16	237.9	18	452.2	-41	905.7	15.0
2004	1,416	7.5	278.0	17	507.0	12	903.0	-0.3
2005	1,751	24	326.0	17	728.0	44	1,011.0	12.0
2006	1,639	-6	335.0	3	547.0	-25	1,112.0	10.0
2007	1,398	-15	476.0	42	268.0	-51	1,298.0	16.0
2008	1,778	27	511.0	7	392.0	46	1,578.0	22.0
Jun-09	718		405.0		38.0		931.0	

Source: Power Development Plan 2007–16. EdL. August 2009.

12. Table 1-6 shows the forecast figures for time frame of REP II project, providing information on connections and power flows between the Lao PDR and neighboring countries within the region.

Table 1-6: Forecast Generation, Imports, Exports, and Consumption—EdL

Year	Generation		Imports		Exports		Consumption	
	GWh	Growth (%)	GWh	Growth (%)	GWh	Growth (%)	GWh	Growth (%)
2009	1,776.3	17	1,011.9	39	296.8	573	2,538.0	15
2010	1,548.9	-13	1,028.0	2	308.7	4	2,968.3	17
2011	1,848.9	19	767.9	-25	610.6	98	3,618.0	22
2012	1,886.0	2	1,092.6	42	1,030.1	69	4,907.0	36
2013	1,886.0	0	441.7	-60	593.7	-42	6,463.4	32
2014	2,701.0	43	277.8	-37	2,484.4	318	6,743.4	4

Source: Power Development Plan 2007–16. EdL. March 2008.

13. The forecast power adequacy situation by area is reflected in EdL’s power development plan for 2007–16, as summarized below:

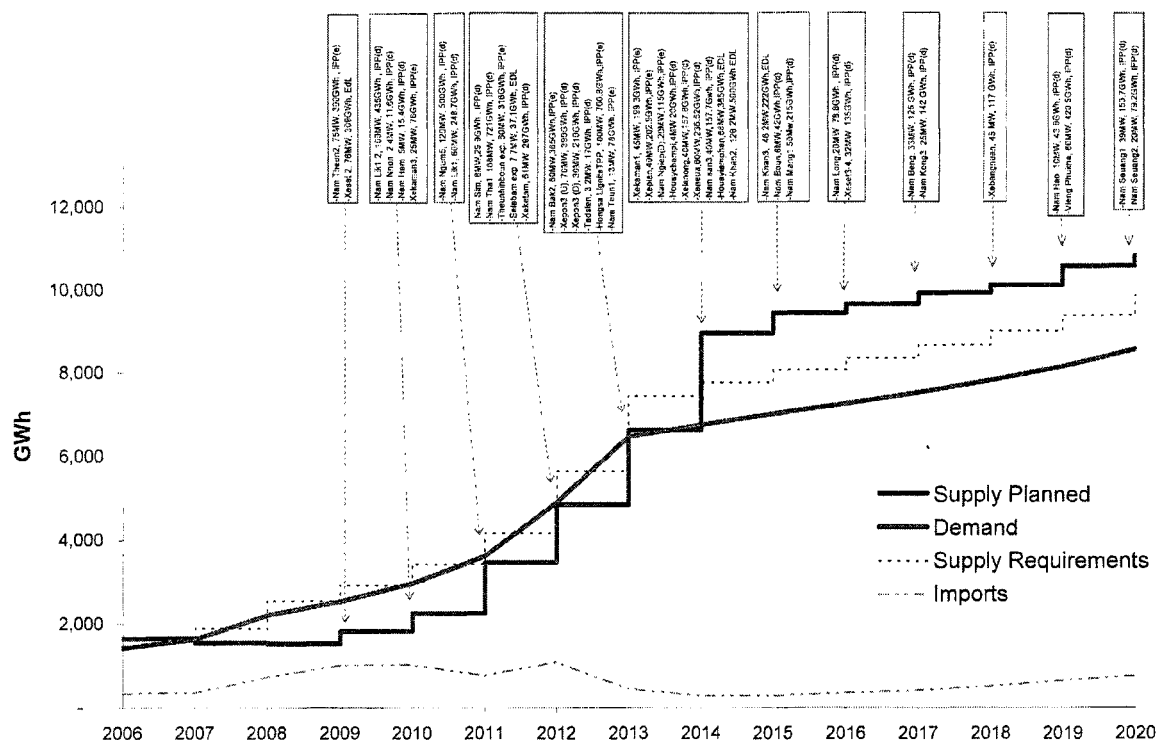
- **Central-1 Area.** This major network includes Vientiane and comprises 70 percent of total EdL consumption. EdL’s 115 kV transmission grid connects the major hydropower plants, Nam Ngum 1 and Nam Leuk. This region exchanges power with Electricity Generating Authority of Thailand (EGAT) grid for load balancing, economy, and reliability. Growth is forecast at 23 percent for 2008–13, resulting in net energy imports during this period (see Figure 1-2). Imports peak at 37 percent in 2010 and 33 percent in 2012, with a positive balance expected after 2014.
- **Central-2 Area.** This is the second largest load center served by EdL, and it accounts for about 16 percent of total consumption. It is served entirely by HV transmission and MV distribution interconnections to Thailand and MV connection to Vietnam. The industrial load is growing

quickly, as is household demand because of rural electrification. A gold and copper mine almost tripled consumption in 2005. EdL would continue to rely on imports, which would partially be offset in 2010 when Nam Theun 2 supplies its domestic share of load.

- **Southern Area.** This is the third largest load center served by EdL, with 10 percent of the total energy consumption. This region has domestic supply sources in the form of the EdL-owned Xeset 1 and Selabam hydropower plants and a 115 kV interconnection with EGAT. Imports are currently at 40 percent of requirements and would drop down to almost zero when Xeset 2 begins operation in 2009.
- **Northern Area.** The smallest load center with only 2 percent of the country’s load relies largely on imports from China, Thailand, and Vietnam, and has no HV grid. EdL will be importing from mentioned countries until 2012, when Nam Tha 1 would be operative. After Nam Tha 1, the Northern Area will export to the Provincial Electricity Authority of Thailand.

14. EdL intends to further expand its domestic hydropower production through its own financing (Xeset 2) and through power purchase agreements (PPAs) with independent power producer hydropower developers (Nam Theun 2). However, the time frame for these additions is 2009–12, and their addition will not eliminate the need for continued imports to individual load centers. EdL’s forecast up to 2020 for the expected domestic demand and the supply needed and planned is shown in Figure 1-2.

Figure 1-2. EdL’s Demand-Supply Balance, 2006–20



D. Rural Electrification Expansion

15. The Lao PDR covers an area equivalent to that of Great Britain, but with a population of only around 5.9 million (population density 23 persons/km², the lowest in the region). Despite the geographic

characteristics, rural electrification is one of the major achievements in the Lao PDR. Electrification rates have quadrupled from 16 percent in 1995 to 63 percent in mid-2009 (see Table 1-7). Yet the electrification coverage in rural areas, where 80 percent of the population lives, remains around 35 percent. The GoL plans to reach 70 percent by 2010 and 90 percent electrification by 2020.

Table 1-7: Electrification in the Lao PDR

<i>Year</i>	<i>Household</i>	<i>Electrified households</i>	<i>Percent electrified</i>	<i>EdL connections</i>	<i>Non-EdL</i>
1993		102,900		101,138	1,762
1994		111,200		111,226	-26
1995	754,265	120,100	16	117,922	2,178
1996	758,036	136,280	18	134,084	2,196
1997	761,808	196,998	26	165,308	31,690
1998	765,579	226,004	30	198,330	27,674
1999	768,142	254,610	33	226,317	28,293
2000	818,668	293,495	36	249,648	43,847
2001	866,277	303,690	35	273,825	29,865
2002	875,744	337,363	39	307,521	29,842
2003	892,872	368,259	41	363,141	5,118
2004	931,000	428,086	46	411,762	16,324
2005	935,019	459,077	48	458,985	92
2006	958,955	504,000	54	465,988	38,012
2007	982,485	536,727	55	518,841	17,886
2008	1,011,778	597,428	59	577,355	20,073
Jun-09	1,011,800	633,787	63	613,947	19,840

Note: EdL achieved new connections for about 20,200 households in 2004 in the 7 central provinces through the SPRE.

16. The Lao PDR embarked on rural electrification in 1987 and focused primarily on grid electrification. It was recognized that rural electrification would take several decades to complete and that very large segments of the rural population in the country would not be connected even in the distant future. Furthermore, as grid electricity extension expands to the more remote areas, the costs for expansion have been increasing. As a consequence, the GoL decided to embark on off-grid electrification in parallel to the grid electrification. As a first step for the off-grid electrification, the GoL began a pilot program as a component of the IDA-supported Southern Provinces Rural Electrification (SPRE 1998–2004). The pilot off-grid under SPRE focused primarily on SHSs. Lessons learned from the Off-Grid Investment Program under SPRE have laid the foundation for scaling up the off-grid rural electrification efforts under the Rural Electrification APL Program Phase I and II projects. The Off-Grid Investment Program under REP I also added pico-hydro and village hydro systems in addition to SHSs. REP II has also added other alternative off-grid rural electrification deliveries models, including biomass and biogas. Similar to grid electrification, off-grid electrification efforts have also been successful. From 2000 to August 2009, the number of households that have been electrified under the Off-Grid Investment Program reached 15,000 households. About 93 percent of these off-grid electrified households use SHSs, and the remaining 7 percent use pico-hydro and village hydro system.

E. Financial Sustainability of the Power Sector

17. EdL was corporatized in 1997, but it remains wholly owned by the GoL. Although cost-profit centers within EdL have been established, financial relations between EdL and the GoL are still intertwined. In January 2005, EdL's receivables from government customers were at 20 months of sales. In addition, the average tariff level was 17 percent below cost recovery, and substantial distortions existed across consumer categories. A rational basis for determining government subsidies for rural electrification has yet to be defined. Although improvements have been recorded in loss reduction, there

is further scope for financial gains with transmission and distribution losses at 16 percent. Another area for improvement is the integration of operations through further development of information systems.

18. There is consensus between the GoL and donors that the following steps need to be undertaken: (a) complete separation of GoL and EdL finances; (b) establishment of an appropriate tariff structure for EdL and mechanisms for regulating tariff on an ongoing basis; (c) loss reduction and DSM in the EdL system; and (d) establishment of transparent subsidy and cross-subsidy mechanisms where necessary to achieve GoL social objectives. IDA and ADB have played a leading role in achievements to date and will continue to stress the objective of financial separation.

19. Implementation of the Sustainability Action Plan (November 2005) has contributed directly to the improvement of EdL’s financial performance. The implementation is ongoing as follows:

- (a) EdL’s operational efficiency has been improving, with distribution system losses falling from above 20 percent in 2005 to about 13 percent in July 2009.
- (b) Settlement of government arrears between the MOF and EdL is on schedule. The MOF and EdL remain current on settlement of past arrears, including for the periods up to FY2004/05 and FY2005/06, and they agree on the amount and a plan to settle arrears from government entities to EdL for FY2006/07, FY2007/08, and estimates of FY2008/2009 and FY2009/2010. The latest quantum of arrears and respective settlement plan agreed between the MOF and EdL are shown in Table 1-8.

Table 1-8: Status of Government Arrears and Settlement Plan

					(LAK million)
<i>Year</i>	<i>Annual consumptions</i>	<i>Annual payment</i> *	<i>Arrears incurred</i> <i>in that year</i>	<i>Accumulated</i> <i>arrears</i>	<i>Settlement</i> <i>plan</i>
Up to 04/05				113,478.47	
2005–06	78,427.22	52,560.75	25,866.47	139,344.94	
2006–07	71,341.86	65,483.05	5,858.81	145,203.75	
2007–08	83,323.85	98,661.21	(15,337.36)	129,866.39	
2009–10	84,500.0	118,366.42	(33,866.42)	95,999.97	45,000
2010–11	-	-	-	-	50,999.97

* Annual payments in 2006–08 included the agreed settlement payments from the MOF for these years.

- (c) The MOF’s budget allocations have been increasing over the past years, and payment of electricity is approaching actual consumption. At the same time, discipline on the use of a budget for electricity has also been enforced, with the payment performance improved, as indicated in Table 1-8.
- (d) The annual tariff adjustment for 2009 followed the tariff adjustment plan agreed at appraisal of REP I. To review the adequacy of the tariff structure and levels with the changed sector context, a new tariff update was launched in 2009 (funded by the Bank’s GMS Power Trade Lao Project), which will provide recommendations for the tariff adjustment covering the period 2009–16. The tariff update with three different scenarios is under study and expected to be implemented in 2010. There is a concern from the government that the tariff increase indicated by the preliminary study results is too high and would be difficult to be absorbed by the poorest part of the people. The issue of tariff adjustment is important, and it will have significant impact on the financial sustainability of EdL and the power sector.

- (e) *DSM and EE*. Ten energy coordinators are carrying out the activities described in the EE section of the action, namely, energy awareness promotion, identification and implementation of EE improvements, and tracking of consumption statistics in 10 government agencies. EE programs were piloted in four buildings and reached an 8 percent of consumption reduction. In the light of these results, the MOF will carry out the program further. It asked EdL to upgrade the EE programs for the remaining 46 buildings with energy audits completed under REP I.

F. Export Revenue Earnings

20. The Lao PDR's power exports to Thailand earn foreign currency and amount to about 10 percent of GDP. Power plays an important role in a country still heavily reliant on external support. In FY2006/07, donor-funded programs accounted for 81 percent of total public capital expenditure, almost 15 percent of GDP. The energy sector is identified as one of the strategic growth sectors by the government, including both rural electrification and strengthening of the central network with a view to power generation for exports.

21. Electricity export is driven by demands in Thailand and Vietnam and, to a lesser extent, Cambodia. Currently, two independent power producers with a total installed capacity of 360 MW are connected to the Thai system and are dispatched by EGAT, the power utility in Thailand. With commissioning of Nam Theun 2 in early 2010, net government revenues from hydropower exports would almost triple, from around US\$130 to US\$350 million. To further explore the hydropower potential for export revenue earning, the GoL has concluded multiple Memorandum of Understanding (MOUs) with the neighboring countries for a total of 11,500 MW of exports. There is room for further expansion of the MOUs without jeopardizing the domestic market. Most future projects are export-oriented, although some may also supply the domestic grid.

G. Increasing Access to the Poor

22. A social impact survey conducted in 2004 by the Department of Electricity for the post-review of the IDA-supported SPRE and the preparation of the follow-up REP I project—the first phase of an APL Program—had identified that the “household connection rate in a village electrified is highly elastic to the upfront connection charge,” which was about US\$100 to US\$150—a major obstacle preventing the poorer households from connection to the grid. The survey indicated that in most of the villages electrified under the SPRE, about 30–40 percent of households have been unable to mobilize money for the connection cost and house wiring, and are thus left without access to electricity, even though the grid is passing right through their villages. In response to this problem, the World Bank and EdL agreed during the preparation of REP I to set up a pilot project to provide interest-free credit to the poorer households. The pilot project was launched in 20 villages during the fall of 2008 and completed by the end of January 2009. The pilot project has been successful. Connection rates in these pilot villages have increased to more than 90 percent. As a result, a revolving fund to assist poorer households with interest-free loans to overcome the hurdle of upfront costs was established within EdL with initial capitalization by the IDA-supported Gender Action Plan (GAP), as well as IDA and GEF resources. It is to be scaled up under REP II with IDA grant and co-financing from AusAID through the project of Additional Financing to REP I. Given the success of the pilot project, the GoL is seeking additional funding from donors to capitalize the revolving fund to scale up the effort in order to increase access among poorer households.

Annex 2: Major Related Projects Financed by the IDA and Other Agencies
LAO PEOPLE'S DEMOCRATIC REPUBLIC
Rural Electrification Phase II Project in Support of the Rural Electrification (APL) Program

<i>Ongoing IDA-financed projects</i>	<i>Sector issue</i>	<i>Latest Supervision (PSR) Ratings (IDA-financed projects only)</i>		
		Implementation progress	Development objective	
Nam Theun 2 Hydroelectric Project	Development of hydropower potential; private-public partnership	S	S	
Nam Theun 2 Social and Environment Project (associated with Nam Theun 2 Hydroelectric Project)	Development of Hydropower potential; emerging environmental and social challenges	S	S	
Lao Environment and Social Project	Emerging environmental and social challenges	S	S	
Laos Great Mekong Subregion Power Trade (GMS PT) Project	Transnational power trade and transmission arrangements	MS	S	
Hydro Power and Mining Technical Assistance Project	Capacity building in the Hydro power sector; governance improvement	NR	NR	
Completed IDA-financed projects		OED Evaluation		
		Outcome	Sustainability	ID Impact
Southern Provinces Rural Electrification Project (Cr. 30470-LA)	Rural electrification and capacity-building in EdL and sector agencies (completed in 2004)	S*	S*	
Provincial Grid Integration Project Cr. 2425-LA	Rural electrification and capacity-building in EdL (completed in 1999)	S	U	M
Southern Provinces Electrification Project Cr. 1826-LA	Rural electrification and capacity-building in EdL (completed in 1994)	HS	L	SB

* Rating in Implementation Completion Report (ICR).

HS = Highly Satisfactory; S = Satisfactory; L = Likely; U = Unlikely; SB = Substantial; M = Modest; NR = Not Rated.

<i>Other development agencies</i>	
Northern Area Rural Power Distribution Project II (ongoing)	ADB
Northern Area Rural Power Distribution Project I (completed)	ADB
Vientiane Distribution System Improvements (completed)	ADB
Off-Grid Renewable Energy Electrification Project (ongoing)	United Nations Development Programme/GEF
Southern Provinces Transmission Development I (ongoing)	China Export-Import Bank
Southern Provinces Transmission Development I (ongoing)	India Export-Import Bank
Transmission Development Project (ongoing)	Lane Xang Minerals Ltd.
Nam Mang 3 Hydropower Project (completed)	China Export-Import Bank
Transmission Line and Substation System Master Plan (completed)	JICA
Institutional Development for Off-Grid Electrification (completed)	ESMAP
Power Sector Policy Reform (completed)	Public-Private Infrastructure Advisory Facility
Xeset 2 Hydropower Project (ongoing)	China Export-Import Bank
115 kV Transmission Line	Namo-Lao-China border (ongoing)

Annex 3: Results Framework and Monitoring

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in support of the Rural Electrification (APL) Program

Table 3-1. Expected Project Outcomes and Indicators for Monitoring

<i>Project development objectives</i>	<i>Outcome indicators</i>	<i>Use of results information</i>
<p>Project Development Objective:</p> <ul style="list-style-type: none"> • Increase access to electricity of rural households in villages of project provinces • Further improve the financial performance of EdL 	<ul style="list-style-type: none"> • Number of households electrified • Rate of return on revalued assets • Debt service coverage ratio • Self-financing ratio • account receivables from Government agencies 	<ul style="list-style-type: none"> • Year 1–2: Assess effectiveness • Year 3–4: inform adjustment of GoL policy or actions to achieve overall GoL rural electrification goals by 2020 • Year 1–4: Assess progress and inform actions and adjustment to improve EdL's financial performance
<i>Intermediate outcomes</i>	<i>Intermediate outcomes indicators</i>	<i>Use of intermediate outcome monitoring</i>
<p>Outcome 1</p> <ul style="list-style-type: none"> • Expanded distribution network for rural electrification 	<p>Outcome 1</p> <ul style="list-style-type: none"> • Length of MV and LV lines installed 	<p>Outcome 1</p> <ul style="list-style-type: none"> • Year 1: Identify progress issue • Year 2: Inform actions to achieve targets • Year 4: Inform follow up investment plan
<p>Outcome 2</p> <ul style="list-style-type: none"> • Increased operational efficiency of EdL 	<p>Outcome 2</p> <ul style="list-style-type: none"> • Overall distribution system loss 	<p>Outcome 2</p> <ul style="list-style-type: none"> • Year 1: Determine effectiveness of technologies and actions • Year 2: Inform EdL's annual investment plan • Year 4: Determine future action plan
<p>Outcome 3</p> <ul style="list-style-type: none"> • Increased efficiency of energy consumption, resulting in greenhouse gas emission reductions 	<ul style="list-style-type: none"> • Measurable increase in awareness and adoption of EE technologies and practices 	<ul style="list-style-type: none"> • Year 1: Establish baseline • Year 2: Assess barriers and inform actions to achieve targets • Year 3–4: Inform policy adjustment to scale up DSM/EE in the country
<p>Outcome 4</p> <ul style="list-style-type: none"> • Diversified renewable energy technologies 	<p>Outcome 4</p> <ul style="list-style-type: none"> • Number of households electrified through off-grid renewable energy technologies 	<p>Outcome 4</p> <ul style="list-style-type: none"> • Year 1: Determine customer interests and barriers • Year 2: Inform adjustment of technology portfolio • Year 4: Inform policy for replication

Table 3-2: Arrangements for Results Monitoring

Result indicators for development objectives	Baseline	Target values				Data collection and reporting		
		Year 1	Year 2	Year 3	Year 4	Yearly and Semiannually; project progress reports		• EdL, MEM • EdL
I. Numbers of households electrified	• 0	• 2,000	• 14,000	• 25,000	• 37,700	Yearly and Semiannually; project progress reports		• EdL, MEM • EdL
II. EdL Financial Performance						Yearly and semiannually; project progress reports; interim financial reports; External Audit Report	Gov. statistics; Internal auditing and financial review; External auditing; Semiannual project progress reports	EdL, MEM
• Rate of return on revalued assets	• <1%	• 1%	• 2%	• 3%	• 4%	• >1.3 times • >15%	• >1.3 times • >15%	
• Debt service coverage ratio	• >1.3 times	• >1.3 times	• >1.3 times	• >1.3 times	• >1.3 times	• >1.3 times	• >1.3 times	
• Self-financing ratio	• >15%	• >15%	• >15%	• >15%	• >15%	• >15%	• >15%	
• Months of account receivables from Government agencies	• 20 months	• 15 months	• 8 months	• 5 months	• < 3 months			
Result Indicator for each Component								
EdL Component								
• Length of MV and LV lines	• 0	• 200 km	• 500	• 800	• 1,209	Yearly and semiannually; project progress reports	Survey; Semiannual project progress reports; completion report of DSM and EE Action Program	EdL
• No. of households connected	• 0	• 0	• 9,000	• 17,000	• 27,700			
• System loss	• >13%	• <13%	• <13%	• <13%	• <13%			
• Measurable increase in awareness and adoption of EE technologies	• 10 GovL agencies under REP 1	• 10% of central GovL agencies	• 20% of central GovL agencies	• 50% of central GovL agencies	• 80% of central GovL agencies			
MEM Component								
• No. of households electrified	• 0	• 2,000	• 5,000	• 8,000	• 10,000	Yearly and semiannually; project progress reports	Semiannual project progress reports	MEM
• No. of rural electrification projects with financial support of REF	• 0	• 0	• 1	• 2	• 3			

Table 3-3: Status of Triggers to Move from Phase I to Phase II

(A) EdL Component				
<i>Subcomponent</i>	<i>Phase I project activities</i>	<i>Triggers</i>	<i>Status</i>	<i>Remarks</i>
A.1 Grid Extension	(i) Implement Phase I grid extension subprojects (ii) Prepare for Phase II	(i) 70% of Phase I households connection targets achieved	(i) On track. About 65.3% (27,407) of the original target (42,000) achieved as of mid-September 2009; and 93.2% of the households that could be achieved (29,400, 70%) with the original financial resources.	(i) The project financial resources can only finance about 70% of the original subprojects at appraisal in 2005 because of major price escalations during 2006-07. Only about 70% of the targeted households will be electrified with the existing resources of REP I. (ii) Preparation for REP II completed.
A.2 Loss Reduction	(i) Development of a Master Plan for distribution loss reduction (ii) Implementation of priority projects (iii) Prep. of program for REP II	(i) Master Plan completed (ii) Priority projects implemented	(i) Fully Satisfied. Master plan Completed (ii) Fully Satisfied. Priority projects implemented. Losses reduced from more	(i) Distribution losses reduced from more than 20% in 2005 to about 13% in 2009. (ii) Preparation for REP II completed.
A.3 Information Technology System and Financial Management	(i) Integration of EdL Headquarters and branch offices (ii) Development of Material Management and Procurement System (iii) Financial management capacity building and training programs on Internal Auditing and Corporate Planning	(i) Billing and accounting systems rolled out to the branch offices in the 7 targeted provinces (ii) Material Management and Procurement System developed and running (iii) Training programs completed	(i) Fully Satisfied. Rollout to all the 14 provincial branch offices completed. (ii) This activity was dropped during the project implementation since there is no urgent need for them and there was a shortage of budget under REP I because of price escalation mentioned above. (iii) Fully Satisfied. Training programs completed	(i) The dropped activity is a minor technical assistance activity, to be addressed at the restructuring together with closing date extension for accommodating additional financing (US\$6.24 million from AusAID for 12,000-15,000 households) to fill up the gaps for the Grid Extension Subcomponent.
A.4 Tariff Reform	(i) Implementation of the Sustainability Action Plan	(i) Phased implementation on schedule	(i) Fully Satisfied. On schedule and the performance has been highly satisfactory	(i) Tariff reform was designed for implementation during 2006-11
A.5 Demand-Side Management and Energy Efficiency Program	(i) Establishment of DSM cell within EdL (ii) Development and implementation of Phase I DSM and EE programs (iii) Prepare program for Phase II	(i) DSM cell established in EdL and running (ii) Phase I DSM and EE programs implemented (iii) Phase II programs developed	(i) Fully Satisfied. DSM cell established and running (ii) Fully Satisfied. Phase I TA for DSM and EE program has been fully completed and implementation of recommendations is underway (iii) Fully Satisfied. Phase II programs fully developed	
(B) MEM Component				
B.1 Off Grid Investment	(i) Implement Phase I off-grid electrification activities (ii) Prepare for Phase II	(i) 70% of household targets achieved	(i) Fully Satisfied. 90% of targeted households electrified.	(i) Installation underway and 93% to be achieved by August 2009.
B.2 Institutional	(i) Management contract for off-grid awarded on competitive	(i) Satisfactory execution of the mgmt. contract	(i) Fully Satisfied. Satisfactorily executed	(ii) Preparation for REP II completed

strengthening	<p>(ii) bidding basis Contract for q quality assurance by a third party awarded</p> <p>(i) Operation and management of REF initially restricted to MEM projects</p> <p>(ii) Development of legal, regulatory and institutional arrangements necessary to enable REF to be accessible to other participants</p> <p>(iii) Project preparation and solicitation documents for alternative model projects</p> <p>(iv) Biomass resources assessment and biomass generation piloting</p> <p>(v) Assessment of income generation linkage with off-grid electrification</p>	<p>(ii) Satisfactory execution of the quality assurance contract</p> <p>(i) REF in smooth operation to support MEM projects</p> <p>(ii) GoL agreement to extend to other participants and all necessary legal provisions developed and approved</p> <p>(iii) Solicitation documents for "other model" projects completed</p> <p>(iv) Resources assessment completed and piloting underway</p> <p>(v) Income generation linkage assessment completed</p>	<p>(ii) Fully Satisfied. Satisfactorily executed</p> <p>(i) Fully Satisfied. REF smoothly operating and financed REP I off-grid electrification</p> <p>(ii) Fully Satisfied. PM Decree issued and REF opened to others through the DOE. REF Operation Manual will be finalized by July 2009.</p> <p>(iii) Fully Satisfied. Solicitation documents for micro/village hydro completed and private sector and public-private partnerships in place</p> <p>(iv) Fully Satisfied. Assessment of biomass resources completed and preparation of pilot projects completed.</p> <p>(v) Fully Satisfied. Assessment report completed and delivered in July 2009</p>	<p>(i) Medium-term grid extension planning for rural electrification completed and identification of REP II grid extension subprojects and beneficiary villages completed. Off-grid electrification, mainly through SHSS, will be started in later 2010 and can be easily coordinated with the grid extension since the grid extension planning is already completed.</p>
B.3 Alternative Rural Electrification Delivery Models	<p>(i) Development of a rural electrification master plan and associated rural electrification database</p> <p>(ii) Assessment of small and mini/micro hydro resource</p> <p>(iii) Assessment of rehabilitation of existing mini/micro hydropower plants</p>	<p>(i) A time bound rural electrification master plan covering the period up to 2020 developed and implemented</p> <p>(ii) Renewable resource inventory completed and rural electrification database established</p> <p>(iii) Assessment of rehabilitation of 20 existing mini/micro hydropower plants completed</p>	<p>(i) On track. Bid Evaluation completed. Signing of contract underway.</p> <p>(ii) Satisfied. Biomass resource inventory completed. Rural electrification database established. Data on biomass to be input in the database</p> <p>(iii) On track. Assessment of rehabilitation of existing mini/micro hydropower plants is under the rural electrification master plan contract</p>	<p>(i) Fully Satisfied. Financing strategy for investment projects are incorporated into individual transactions</p> <p>(ii) Fully Satisfied. 14 small hydro project sites have been prepared with detailed feasibility studies; solicitation documents developed under B.3</p>
B.4 Rural Electrification Master Plan and Database	<p>(i) Revision of Power Develop. Plan in line with Power Sector Development Plan</p> <p>(ii) Development of financing strategy</p> <p>(iii) Preparation of legal documents for small-scale hydropower projects concessioning to independent power producers</p>	<p>(i) Sector financing strategy developed</p> <p>(ii) Preparation of two small hydropower projects, including solicitation documents for concessioning to independent power producers completed</p>	<p>(i) Fully Satisfied. Financing strategy for investment projects are incorporated into individual transactions</p> <p>(ii) Fully Satisfied. 14 small hydro project sites have been prepared with detailed feasibility studies; solicitation documents developed under B.3</p>	
B.5 Sector Financing Strategy	(C) For both MEM and EdL Components			
Safeguard Capacity Building	<p>(i) Implementation of safeguard training program and study tours</p> <p>(ii) Identification of capacity building program for Phase II</p>	<p>(i) Satisfactory completion of training programs developed during Phase I and agreed by IDA</p>	<p>(i) Fully Satisfied. Satisfactory completion of agreed training programs</p>	<p>(i) Capacity building programs under REP II fully developed.</p>

Annex 4: Detailed Project Description

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in Support of the Rural Electrification (APL) Program

I. Project Phasing

1. REP II would be implemented over a four-year period, with project completion by December 30, 2013, and it would be financed by the second tranche of an IDA grant under the IDA Adaptable Program Loan (APL).

2. The total cost of the Phase II project is estimated at US\$35.80 million, including contingencies, out of which US\$29.32 million is for the EdL component and US\$6.47 million for the MEM component. Proposed financing sources include an IDA grant of US\$20.0 million (about 55.9 percent), NORAD co-financing of US\$4.0 million (about 11.2 percent), part of and IFC loan to EdL of US\$3.88 million (10.8 percent), an ESMAP grant of US\$0.5 million (about 1.4 percent), EdL/MEM counterpart funds of US\$4.06 million (about 11.3 percent), and consumer contributions for house wiring and SHS installation of US\$3.36 million (about 9.4 percent).

II. Project Structure

3. The Phase II project is structured around two main components. A summary of the main and subcomponents, their total cost, and financing by IDA is given in Table 4-1.

Table 4-1: Summary of Phase II Project Components

	<i>Component</i>	<i>Source (US\$ million)</i>		
		<i>Total cost</i>	<i>IDA</i>	<i>Other</i>
A	EdL Component			
	A.1 Grid extension	22.84	14.60	8.25
	A.2 Loss Reduction	4.88	1.00	3.88
	A.3 Information Technology System and Financial Management	0.30	--	0.30
	A.4 Safeguards Capacity Building	0.25	--	0.25
	A.5 DSM and EE Program	1.05	0.30	0.75
	Subtotal	29.32	15.90	13.43
B	MEM Component			
	B.1 Off-Grid Investment Program	4.35	4.00	0.35
	B.2 Institutional Strengthening	0.50	--	0.50
	B.3 Alternative Rural Electrification Delivery Models	0.70	--	0.70
	B.4 Rural Electrification Master Plan and Database	0.10	--	0.10
	B.5 Organizational Strengthening of MEM	0.72	0.10	0.72
	Subtotal	6.47	4.00	2.37
		35.80	20.00	15.80

4. Project design has followed the successful experience and recommendations of REP I, for which the project design was underpinned mainly with the lessons and experiences of previous IDA-supported rural electrification projects and the PHRD-financed studies during the preparation for the rural electrification APL Program, including: (a) a socioeconomic survey of electrified and un-electrified villages and households; (b) a tariff study; (c) an rural electrification framework study, including review of existing off-grid delivery models and examining alternatives for scaling up off-grid electrification; (d) a study to define the overall financing strategy for the sector; and (e) a distribution system loss reduction study.

A. EdL Component

A.1. Grid Extension

5. **Physical Parameters.** The grid extension subcomponent would provide connections to grid electricity to about 27,700 households in the project provinces, which comprise about 19,700 households with 50 new grid extension subprojects and 8,000 households under the Power to the Poor program—connection of households to the existing grid. The network extension would comprise approximately 1,125 km of 22 kV, 84 km of 12.7 kV, and 611 km of 0.4 kV transmission or distribution lines, 370 sets of transformers of various types and capacities, and in-house wiring for the targeted households in the targeted households (Table 4-2).

Table 4-2: REP II—Scope of Grid Extension

Province	No. of sub-project	No. of villages	No. of HHs	0.4 kV line (m)	Transformers (set)				MV line (m)		
					3 phase	Mono	SWER	Total	22 kV	12.7kV	Total
Bolikhmxy	10	25.00	1,756	78,560	16	7	7	30	197,700	20,000	217,700
Khammouane	11	61.00	3,100	98,550	34	28	-	62	233,020	-	233,020
Savannakhet	8	109.00	4,653	138,990	50	60	-	110	192,385	64,355	256,740
Saravan	8	58.00	3,142	134,400	37	25	-	62	122,514	-	122,514
Xekong	3	19.00	910	36,400	9	10	-	19	92,205	-	92,205
Champasak	6	60.00	4,670	118,720	52	10	-	62	185,977	-	185,977
Attapeu	4	24.00	1,525	55,661	23	2	-	25	101,820	-	101,820
Grand Total	50	356.00	19,756	661,281	221	142	7	370	1,125,621	84,355	1,209,976

Note: SWER stands for single-wire-earth-return system; HH stands for households.

6. **Technical Assistance for Implementation.** This subcomponent would also comprise technical advisory services to EdL for (a) implementation and supervision and (b) capacity building and training for EdL on designing standard and optimization and module specifications for goods and materials of transmission and distribution lines and substations.

7. **Village Screening Process.** Villages were prioritized on the basis of their socioeconomic profiles and taking into consideration of provincial government plans for development of specific areas (such as ethnic minority areas). A “weighted connections” that would accrue from electrification of a subproject covering a cluster of villages was calculated, and the subprojects were ranked on the basis of the cost of their electrification divided by the “weighted connections” derived thereof.

8. Villages to be electrified and associated subprojects were first identified based on the following factors: (a) proximity to existing major roads; (b) priority to villages with larger number of households; and (c) priority to villages with greater economic and social activities, measured by the numbers of clinic, hospital, saw mill, rice mill, school, temple, irrigation and other small industries. Different weights were assigned to connections, with larger weights applied to connections likely to generate economic use of electricity, such as sawmills and schools, based on which weighted connections numbers were derived. Then the scope of subprojects and associated villages were defined through applying cutoff rates on cost per weighted connection, which is calculated with the total cost of each subproject divided by the number of total weighted connections served by the subproject. Finally the scope was adjusted to include priority villages specially identified by provincial governments for promoting economic growth or achieving other social objectives (such as development for minority people). See sections below for the detailed screening process.

9. Selection of villages to be electrified through grid extension under Phase I and II in sequence has gone through the following village screening process.

- (a) Based on expected amounts of funds available and initial discussions with EdL headquarters, EdL branch offices made proposals to the headquarters of subprojects selected based on the following factors: (i) proximity to existing major roads; (ii) priority to villages with larger number of households; (iii) priority to villages with greater economic and social activities, measured by the numbers of clinics, hospitals, sawmills, rice mills, schools, temples, irrigation and other small industries; (iv) priority to villages specially identified for promoting economic growth or achieving other social objectives (for example, development for minority people) by provincial governments; and (v) priority to villages with lower cost per household of electrification, which is calculated with the total cost of each subproject excluding the main MV lines divided by the number of households served by the subproject, and institutions with economic and social activities such as schools and saw mills were not included in this calculation as consumers.
- (b) Based on expected IDA grant and the EdL self-financing available for the grid extension subcomponent, EdL headquarters then applied cutoff rates, which are different from province to province to allow balance of funds distribution among the seven provinces, based on cost per household and defined the scopes for Phase 1 and 2 in sequence, and sent the revised scopes back to branch offices for comments.
- (c) Branch offices generally agreed with the Headquarters' choices of scopes for Phase 1 and 2, with some adjustment of shifting a limited number of villages between the two Phases. Branch offices provided justifications of the adjustment, which is mainly to allow the local Governments to achieve their social objectives.

- (d) Following recommendation of the IDA mission in May 2004, the cutoff rates were changed from cost per household to cost per weighted connection (see Table 4-3). Calculation of the latter takes into consideration of the cost of MV lines, and the economic activities and government social objectives, which were converted into weighted connections through assigning appropriate weights to these activities either according to revenues (for example, a sawmill could be 20 connections if the revenue from it is about 20 times the revenue from a household) or importance in achieving Governments' social objectives (for example, more weights than estimation of times of revenues may be given to schools or clinics. The revised cost per weighted connection for a village was obtained through the total cost of a subproject and its shared cost of associated MV lines divided by total numbers of weighted connections severed by the subproject. See Table 4-3 for the weight allocation and Table 4-4 for the weighted connection of one sample subproject of REP I.

Table 4-3: Actual Cutoff Cost per Weighted Connection under REP I

No.	Province	No. of Sub-projects	Cutoff cost per weighted connection (US\$)	Remarks on actual cost per weighted connection
1	Bolikhamxay	12	250	one exception at US\$442 for government social objectives
2	Khammouane	14	250	one exception at US\$352 for government social objectives
3	Savannakhet	16	328	two exception at US\$344 and US\$388 respectively for government social objectives
4	Saravan	8	258	
5	Xekong	3	250	
6	Champasak	10	266	one exception at US\$341 for government social objectives
7	Attapeu	5	346	one exception at US\$475 for government social objectives
	Total	68		

Table 4-4: Weighted Connection of One Sample Subproject of REP I

Economic Activities	Total No.	Weight	Weighted Connections	Remarks
Household	419	1	419	Household revenue considered the base revenue
Church	0	15	0	10 points for estimated revenue, 5 points for religion importance
School	4	25	100	20 points for estimated revenue, 5 points for social importance
Irrigation	2	35	70	30 points for estimated revenue, 5 points for social importance
Rice mill	16	25	400	weighted according to estimated revenue
Clinic	0	7	0	4 points for estimated revenue, 3 points for social importance
Saw mill	0	20	0	20 points for estimated revenue
Total			989	

A.2. Loss Reduction

10. The objective of this component is to reduce EdL's current distribution system losses to less than 13 percent by the end of REP II. This component would enhance EdL's ongoing loss reduction (technical and nontechnical) efforts, for which EdL is investing about US\$1 million per year. This component will (a) support the implementation of prioritized investment projects recommended by the Loss Reduction Master Plan and (b) provide technical assistance to EdL for nontechnical loss reduction activities (see Table 4-5).

Table 4-5: REP II—Loss Reduction Subcomponent

<i>Item</i>	<i>IDA (US\$)</i>	<i>NORAD (US\$)</i>	<i>EdL (US\$)</i>
(1) Technical Assistance		680,000	
(2) Goods			
(a) Line equipment and materials			2,880,000
(b) Capacitors, meters and instruments	1,000,000		
(c) Works			320,000
Total	1,000,000	680,000	3,200,000

11. **Technical Assistance Services.** The technical assistance will support nontechnical loss reduction, which is a continuation of the support provided by the additional financing from AusAID for REP I:

- (a) Meter quality management (inspections, database, and unified operational guidelines).
- (b) Billing process management (debt control, early payment incentives, effective disconnection policy)
- (c) Personnel skill development in metering, meter reading, and bill collection (field staff enlightenment, instruction manual, on- and off-the-job training).
- (d) Customer-side management for commercial loss reduction (power theft control, public awareness program, and large customer monitoring).

A.3. Information Technology System and Financial Management

12. The Information Technology System, including computerized billing and accounting systems, set up under the SPRE and REP I, has been rolled out at the branch offices of the 17 provinces. However, the system is not fully operational in some of the branch offices because training of the branch office staff on data input and operation and maintenance of the system is needed. A fully operational system will help (a) integrate the operation of EdL headquarters and branch offices in the project provinces by making the existing systems fully operational; and (b) strengthen its financial management. This subcomponent consists of technical assistance support EdL in (a) operation and maintenance of the billing and accounting system; and (b) training of EdL branch office staff in data entry and system operation and maintenance.

A.4. Safeguards Capacity Building

13. As a continuation of the safeguard capacity building with the staff at EdL's headquarters offices, this subcomponent would focus on enhancing the capacity of EdL's branch offices in

good engineering for implementation of distribution and substation projects. This is also complementary to the safeguard capacity building under the IDA-supported the Hydropower and Mining Technical Assistance Project, which is under preparation and will be focusing on the safeguard capacity in the energy sector in a systematic and coherent approach.

A.5. Demand-Side Management and Energy Efficiency Program

14. REP Phase II will continue supporting the implementation of the Action Plan under the DSM and EE Master Plan prepared under REP I. The technical assistance will include: (a) maintaining the energy end-use database for DSM planning; (b) implementation of an energy audit for government departments and agencies and other pilot projects and awareness building efforts for high-priority target markets, such as commercial air conditioning and lighting, residential lighting and appliance standards, and water pumping; and (c) the design of full-scale programs based on pilot project results.

B. MEM Component

B.1. Off-Grid Investment Program

15. The Off-Grid Investment Program under Phase II would electrify about 10,000 households across all 17 provinces through off-grid technologies, including SHSs and pico-hydro.

B.2. Institutional Strengthening

16. As in REP I, technical assistance will be provided under REP II to (a) hire a consultant management firm as the management contractor to support the DOE of MEM for management of the existing off-grid program; (b) implementation of its comprehensive program of management; and (c) hire individual technical consultants to support DOE to monitor the performance of the outsourced management and the Off-Grid Investment Program, including provincial ESCOs and village electricity managers.

B.3. Alternative Rural Electrification Delivery Models

17. This subcomponent will provide technical advisory services to MEM to: (a) promote alternative renewable energy development, including micro- and mini-hydro, biomass, biogas, and biofuel technologies, and develop associated financing mechanisms and delivery models for off-grid rural electrification with the support of the REF subsidy mechanism; and (b) support small and medium enterprises in income generation linked to the use of the renewable energy use.

18. Off-grid rural electrification efforts have so far relied on SHSs. Initial examinations show potential productive applications of biomass and biogas in remote areas. Hence, this technical assistance would assess their potential and explore productive applications of bio-energy (including biomass gasification, biogas, biomass burning, and extraction of energy oils from seeds) for village industries (such as rice mills and irrigation pumps), and pilot some promising projects.

19. Income-generation linkages to village-level, off-grid electrification will also be assessed under this technical assistance, to allow appropriate design of activities for income generation to achieve significant impact of rural electrification.

20. Alternative rural electrification delivery models to be considered include (a) contracting to private entrepreneurs some operational functions, including construction, operation, and maintenance of new sections of the distribution grid; (b) refurbishment of existing micro-hydro systems in remote areas, through such approaches as refurbish-operate-transfer; and (c) arrangements for the development of renewable electricity generation resources and distribution by private entrepreneurs through build-operate-transfer type approaches. The technical assistance would assist development of mechanisms for channeling subsidies to support investments in delivering rural electrification and appropriate legal, regulatory, and contractual arrangements to enable alternative delivery mechanisms. It would also support MEM in preparing and inviting bids, and in overseeing pilot projects.

B.4. Rural Electrification Master Plan and Database

21. This subcomponent will provide technical assistance to EdL/MEM to maintain and periodically update the rural electrification database and master plan developed under REP I. On- and off-the-job training will also be provided, including Geographic Information System planning and rural electrification data and resource compilation, identification of priority areas for development and the selection of the most appropriate technologies, and evaluation of the feasibility of proposed systems.

B.5. Organizational Strengthening of MEM

22. This subcomponent will provide technical advisory services to MEM to (a) support the project management unit in the implementation of Part B of the project; and (b) establish and support the initial operation of a REFS to enable REF in its mandate.

23. This technical assistance will support upgrading of staff capabilities and development of new areas of expertise within DOE of MEM. This would enable the DOE to undertake its expanded role in governing the power sector, including sector reform and regulation, rural electrification planning (including continuous updating of the rural electrification master plan and database), and coordination of on- and off-grid electrification programs.

Annex 5: Project Costs

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in Support of the Rural Electrification (APL) Program

A. Cost Estimation of Phase II Project

Table 5-1: REP II—Cost Estimation by Category

<i>Cost by category</i>	<i>US\$ millions</i>			<i>LAK billions</i>		
	<i>Local</i>	<i>Foreign</i>	<i>Total</i>	<i>Local</i>	<i>Foreign</i>	<i>Total</i>
1. Goods	4.20	22.21	26.41	35.69	188.79	224.49
2. Works	4.52	-	4.52	38.42	0.00	38.42
3. Services	1.10	3.29	4.39	9.35	27.97	37.32
4. Training		0.20	0.20	0.00	1.70	1.70
5. Incremental operating cost	0.10	0.10	0.20	0.85	0.85	1.70
Total base cost	9.92	25.80	35.72	84.31	219.31	303.62
Physical contingencies	-	-	0.00	-	-	0.00
Price contingencies	0.08	-	0.08	0.66	-	0.66
Total cost	10.00	25.80	35.80	84.98	219.31	304.29
Total financing requirements	10.00	25.80	35.80	84.98	219.31	304.29

Note: US\$1= LAK 8,500.

Table 5-2: REP II—Cost Estimation by Component

<i>Cost by component</i>	<i>US\$ millions</i>			<i>LAK billions</i>		
	<i>Local</i>	<i>Foreign</i>	<i>Total</i>	<i>Local</i>	<i>Foreign</i>	<i>Total</i>
1. EdL component	8.58	20.68	29.26	72.92	175.79	248.71
2. MEM component	1.34	5.12	6.46	11.39	43.52	54.91
Total base cost	9.92	25.80	35.72	84.31	219.31	303.62
Physical contingencies	-	-	0.00	-	-	0.00
Price contingencies	0.08	-	0.08	0.66	0.00	0.66
Total cost	10.00	25.80	35.80	84.98	219.31	304.29
Total financing requirements	10.00	25.80	35.80	84.98	219.31	304.29

Note: US\$1= LAK 8,500.

1. The total cost of the Phase II project is estimated to be LAK 304.29 billion or US\$35.80 million equivalent (US\$29.32 million for the EdL component and US\$6.47 million for the MEM component). Costs were based on the latest unit prices of REP I. For physical investment, physical contingencies are not provided, since designs have been practically firmed up, and price contingencies are provided for local cost at 10 percent. Services would usually be covered with lump-sum contracts.

B. EdL Component—Detailed Cost Estimation of Phase II Project

Table 5-3: REP II—Cost Estimation by Category—EdL Component

<i>Cost by category</i>	<i>US\$ millions</i>			<i>LAK billions</i>		
	<i>Local</i>	<i>Foreign</i>	<i>Total</i>	<i>Local</i>	<i>Foreign</i>	<i>Total</i>
EdL component						
1. Goods	4.06	18.20	22.26	34.50	154.71	189.21
2. Works	4.52	-	4.52	38.42	0.00	38.42
3. Services		2.28	2.28	-	19.38	19.38
4. Training		0.10	0.10	-	0.85	0.85
5. Incremental operating cost		0.10	0.10	-	0.85	0.85
Total base cost	8.58	20.68	29.26	72.92	175.79	248.71
Physical contingencies	-	-	-	-	-	-
Price contingencies	0.06	-	0.06	0.54	-	0.54
Total cost	8.64	20.68	29.32	73.47	175.79	249.26
Total financing requirements	8.64	20.68	29.32	73.47	175.79	249.26

Note: US\$1= LAK 8,500.

C. MEM Component—Detailed Cost Estimation of Phase II Project

Table 5-4: REP II—Cost Estimation by Category—MEM Component

<i>Cost by category</i>	<i>US\$ millions</i>			<i>LAK billions</i>		
	<i>Local</i>	<i>Foreign</i>	<i>Total</i>	<i>Local</i>	<i>Foreign</i>	<i>Total</i>
MEM Component						
1. Goods	0.14	4.01	4.15	1.19	34.09	35.28
2. Services	1.10	1.01	2.11	9.35	8.59	17.94
3. Training		0.10	0.10		0.85	0.85
4. Incremental operating cost	0.10		0.10	0.85		0.85
Total base cost	1.34	5.12	6.46	11.39	43.52	54.91
Physical contingencies	-	-	0.00	-	0.00	0.00
Price contingencies	0.01	-	0.01	0.12	0.00	0.12
Total cost	1.35	5.12	6.47	11.51	43.52	55.03
Total financing requirements	1.35	5.12	6.47	11.51	43.52	55.03

Note: US\$1= LAK 8,500.

D. Financing Arrangement by Component and Source for Phase II Project

Table 5-5: REP II—Financing Plan

	<i>IDA</i>	<i>NORAD</i>	<i>ESMAP</i>	<i>IFC</i>	<i>EdL</i>	<i>MEM</i>	<i>Consumer</i>	<i>Sub-total</i>
A EdL component								
A.1 Grid Extension	14.60	0.50		3.88	0.70		3.16	22.84
A.2 Loss Reduction	1.00	0.68			3.20			4.88
A.3 Information Technology System and Financial Management		0.30						0.30
A.4 Safeguard Capacity Building		0.25						0.25
A.5 Demand-Side Management and Energy Efficiency Program	0.30	0.75						1.05
Subtotal	15.90	2.48		3.88	3.90		3.16	29.32
B MEM component								
B.1 Off-grid Investment Program	4.00					0.15	0.20	4.35
B.2 Institutional Strengthening		0.50						0.50
B.3 Alternative Rural Electrification Delivery Models		0.20	0.50					0.70
B.4 Rural Electrification Master Plan and Database		0.10						0.10
B.5 Organizational Strengthening of MEM	0.10	0.72						0.82
Subtotal	4.10	1.52	0.50			0.15	0.20	6.47
Total	20.00	4.00	0.50	3.88	3.90	0.15	3.36	35.80
Percentage	55.9	11.2	1.4	10.8	10.9	0.4	9.4	100

Annex 6: Implementation Arrangements

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in Support of the Rural Electrification (APL) Program

1. Rather than the SPRE approach of a single credit to be implemented over seven years, IDA funds for REP will be provided in two phases, covering implementation periods of 44 and 36 months, respectively, with several months of overlapping. This APL approach would accommodate both the current severe constraints on IDA funds and the long time span necessary to implement substantive sector reforms in a consensus-based political environment. The APL approach would enable IDA to provide support in a flexible manner—providing future support when the project-supported investment and reform activities have sufficiently advanced to receive further IDA support. The milestones of the reform activities to be reached are proposed as triggers for Phase II of the APL Program (see Annex 3). For the physical investment subcomponents, the milestones are for physical achievements, but for the technical assistance components for sector reform, the milestones represent evidence of the GoL's commitment to the sector reform. Implementation of the two phases may overlap if the triggers are achieved during the implementation of Phase I (see Annex 3).

A. Implementing Agencies

2. The project will be implemented by EdL and MEM jointly.

A.1. EdL Component

3. The EdL component consists of both physical investment activities and institutional strengthening activities, as described in Section A of Annex 4. The same EdL project office in headquarters and one construction team at each of the five branch offices⁷ will also be responsible for implementation of the EdL component under the REP II. The project office will be responsible for overall management and control of the project execution and will maintain close coordination with MEM, IDA, and NORAD, while the branch offices will be responsible for implementation of physical subprojects in the seven central and southern provinces.

4. **Project Office in Headquarters.** The same Project Office and Project Manager in EdL for REP I will be responsible for implementation of the EdL component under REP II.

5. **Deputy Project Manager.** Two deputy project managers are assigned to assist the project manager. The deputy project managers are responsible for planning, design, procurement, and supervision of construction works to be carried out by the branch offices. One deputy project manager will take charge of the construction works in Bolikhamxay, Khammouane, and Savannakhet provinces, and the other for works in Saravan, Xekong, Champasak, and Attapeu provinces.

6. **Construction and Installation Teams.** Under each deputy project manager, there is one construction and one installation team, Team 1 and Team 2, respectively, deployed for control and management of construction and installation works. Each team has one team leader and one deputy team leader who are well-experienced distribution engineers. They are in charge of planning, design and any

⁷ EdL has one branch office in Saravan to manage both Saravan and Xekong provinces, as well as one branch office in Champasak for Champasak and Attapeu provinces.

modifications where required, procurement of materials, and supervision and monitoring of construction works for the respective provinces.

7. **Assistant Engineers.** Five assistant engineers will be assigned under the construction and installation teams—one engineer for each construction team of branch offices, for coordination and communication between the branch offices and the project office at headquarters to collect necessary information from and forward proper instructions to the branch offices.

8. **Administration Officers.** The administration officer will be responsible for all the administrative work regarding the execution of the Phase II project. Two administration officers are to be assigned during the construction period.

9. **Accounting Officer.** The accounting officer will be responsible for all the accounting work regarding the Phase II project execution.

10. **Construction Team in Each Branch Office.** Each branch office will organize its own construction team for construction of a 22 kV, 12.7 kV, and LV distribution system under REP II. To manage this construction team, each branch office will have the following arrangement.

11. **Construction Team.** Each branch office has its own construction team for construction of 22 kV and LV grid extension subprojects. Each construction team consists of 30–50 members, that is, supervisors, technician, linesmen, operators, drivers, and skilled and unskilled laborers.

12. **Team Leader.** The team leader shall be responsible for management and construction of grid extension subprojects in the respective province(s). The team leader is also responsible for coordination with the project office in the headquarters in reporting the progress of works, issues, and procurement requirement.

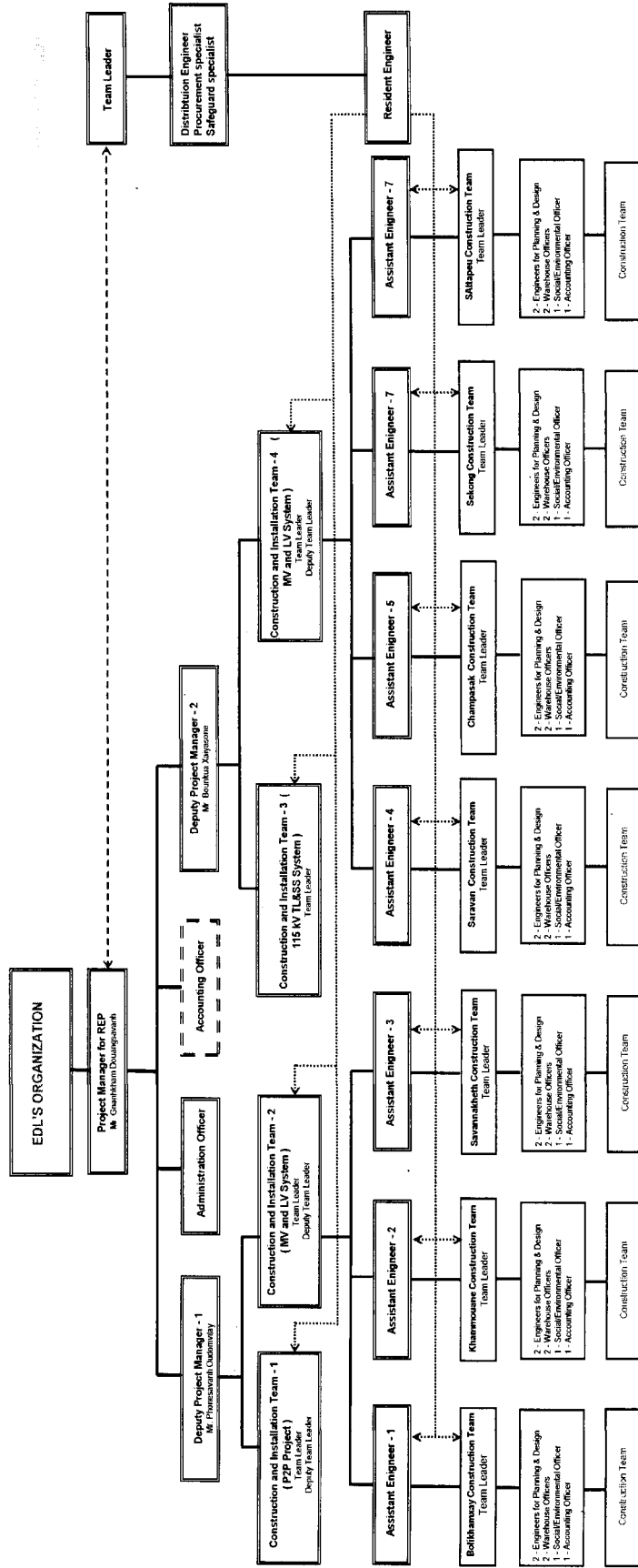
13. **Distribution Engineers.** Two distribution engineers will be assigned for each construction team. They are responsible for planning, design, and construction supervision of 22 kV and LV grid extension subprojects in technical aspect. During the execution of the project, the planned distribution system may require modifications because of the change of site conditions after the detailed design has been confirmed. The distribution engineers will be responsible for modification work of the original design of the system in consultation with the project office at headquarters.

14. **Social/Environmental Officer.** Each construction team will have one social/environmental officer who will have the responsibility to minimize the social and environmental impact of the project during the construction and after completion of the project. The officer will monitor the preparation and implementation of action plans (Resettlement Action Plans, Environmental Management Plans, and Ethnic People's Development Plan), as necessary, to prevent or minimize the social and environmental impacts according to agreed policy frameworks for safeguards.

15. **Warehouse Officer.** The warehouse officer will be responsible for handling, control, and management of materials and equipment delivered by supply contractors. The officer shall maintain all the records of deliveries by the contractors and quantities of materials and equipment handed over to the construction teams. Because the management and control of materials and equipment in warehouses is one of the important tasks in the execution of REP, two warehouse officers will be stationed at each warehouse to maintain the proper records of receiving and delivery of materials.

16. **Accounting Officers.** The accounting officer, one for each construction team, will be responsible for the accounting of activities undertaken by each construction team.
17. **Consultant Team.** A consultant team will be hired to assist EdL in supervision of the project implementation.
18. **DSM Team.** In order to carry out the DSM programs and related activities, EdL has established a DSM Cell under REP I located in the Distribution Division of EdL. The DSM Cell operates under the direction and supervision of a DSM Steering Committee that has overall responsibility for establishing DSM policies and programs, supervising the activities funded by donor agencies, and providing overall guidance to the DSM Cell Manager and key staff. The members of the Steering Committee include representatives of senior management of MEM, EdL, WREA, the Lao National Committee for Energy, and the State Planning Committee.
19. The DSM Cell consists of a manager supported by two project engineers (one for industrial-commercial consumers and one for residential-agricultural), one marketing and promotion specialist, several technicians, and one administrative support person.
20. EdL's organization chart for arrangement of project implementation is illustrated in Figure 6-1 below.

Figure 6-1: EdL Organizational Arrangement for Implementation of REP II



A.2. MEM Component

21. The MEM component includes activities as described in Annex 4, comprising (a) the investment component; (b) consulting services for the day-to-day management of the Off-Grid Investment Program; (c) the sector reform component, including institutional and organizational strengthening, alternative rural electrification technologies and delivery models, rural electrification master planning, and promotion of private sector investment in off-grid renewable energy development; and (d) consulting services for technical advisory work, financial management, procurement, and logistics of office operations.

22. Because of the limited procurement and financial management capacities of the MEM project management unit and institutional constraints of being a government office, the implementation of the off-grid investment activities and associated social and environment management will be handed over to a third party—a consulting firm—through a management contract. This is the same approach that was taken under REP I for the off-grid investment activities. After the transition, MEM will oversee the off-grid program while continuing to implement all technical assistance activities associated with MEM component, including procurement, financial management, and other technical assistance activities.

23. The emphasis on outsourcing off-grid implementation directly resulted from evaluation of the predecessor project. IDA undertook a formal interim evaluation of the SPRE GEF MSP off-grid project as part of its responsibilities. The interim evaluation was conducted in accordance with GEF guidelines by an independent consultant. Although the consultant rated the SPRE GEF MSP as “Satisfactory” with regard to both Outcome/Achievement of Objectives and Sustainability, the consultant has noted that program experience thus far has shown that the constraints associated with the off-grid office’s position as a government office leads to delays in its operations and difficulties in performing its work. The consultant recommended that the management of an expanded Off-Grid Investment Program undertaken by REP program be transitioned to a private or joint venture company, allowing for “...more efficient operations and increased flexibility in design, a greater focus and transparency in its work and stronger incentives through the linking of payments to the company to its performance; the company would need to have the authority to take procurement and other decisions, where delays often occur during the implementation of SPRE, and would be accountable to MEM and the IDA.”

24. MEM oversight of the Off-Grid Investment Program and implementation of the sector reform activities will be conducted by the same project management unit for REP I, located within the DOE of MEM. The project management unit will provide overall administration, especially concerning procurement and financial management of the IDA Designated Account. The project management unit is staffed with a *project manager* already appointed by MEM, an *accounting officer*, and two new appointed *procurement officers*. The *project manager* is a MEM employee who has overall administrative authority over the MEM component operations subject to the director of the DOE within MEM. The *accounting officer* is responsible for maintaining the accounting and books of the project management unit, including all transactions related to the Special Accounts and subsidiary Operating Accounts. The *project manager* and the *accounting officer* are charged with overseeing the operations of the management contractor, especially reviewing reports and processing payments and repayment flows from program participants. With assistance of an *international procurement consultant* to be hired, the *procurement officers* are responsible for preparation of bid documents for centralized procurement and the supply of materials and equipment related to the Off-Grid Investment Program, especially ICB procurements. The procurement officer will also be responsible for implementing the procurement plan associated with the MEM component, including identifying qualified consultants to undertake the several assignments funded by IDA grants.

B. Implementation Schedule

25. REP II will be implemented over a four-year period from January 2010 to December 2013.

26. **Implementation Schedule of the EdL Component.** The implementation schedule is planned as follows:

Preparatory Stage. Bidding for supply of materials and equipment will be executed from April 2010. Supply of materials and equipment is divided into 8 lots. Bids for the 8 lots for grid extension will be invited during two months from April to May 2010. Evaluation of the bids for all lots will be carried out by the consultant and the EdL's Project Office for one month after closing the bids for recommendation of the highest evaluated bidders to be awarded.

The evaluation reports for all lots shall be approved by the Committee of EdL and the IDA during the following two months. After obtaining their approvals, the contract negotiation with the selected bidders will be carried out for awarding the contracts. All of this work will be completed by the end of August 2010, as indicated by the Procurement Plan, and all the contracts will be ready for signing.

Implementation Stage. After the effectiveness of the IDA grant for REP Phase II (expected January 2010), most of the contracts associated to secured financing would be signed by September 2010. All the contractors should be able to commence their works immediately after the signing.

27. **Implementation Schedule of the MEM Component.** The implementation schedule is planned as follows:

Preparatory Stage. Procurement for the consulting services for the day-to-day management of the Off-Grid Investment Program will be completed upon project effectiveness.

Implementation Stage. Implementation of all activities of the MEM component will commence upon grant effectiveness, expected in January 2010.

C. Monitoring and Evaluation

28. The key indicators in Annex 3 will be monitored and evaluated by EdL and MEM as the implementing agencies. These two agencies will be responsible for maintenance and updating of socioeconomic data collected under the PHRD-financed impact and benefit survey of electrification to evaluate progress made toward the CAS-related and national goals. Statistics and survey data collected from the project by EdL and MEM will provide the basis for the annual progress report, on which the monitoring will be based during the project implementation. Environment and resettlement monitoring reports by specialists will supplement the progress reports.

29. During the project implementation period, the IDA task team will supervise the project implementation with full due diligence. After project completion, the recipient will prepare a completion report to evaluate achievement of project objectives, outputs, and impacts. Within six months after project completion, the IDA task team will prepare an Implementation Completion Report to assess the project in full aspects according to IDA policy.

Annex 7: Financial Management and Disbursement Arrangements

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in Support of the Rural Electrification (APL) Program

A. Summary of the Financial Management Assessment

1. A financial management capacity assessment of EdL and the DOE/MEM was undertaken in June 2009 to determine whether the respective implementation agencies have adequate financial management systems and related capacity in place, which would satisfy the World Bank's Operational Policy/Bank Procedure 10.02 with respect to financial management. Under the policy, both implementation entities are supposed to have and maintain adequate financial management systems, which include budgeting, accounting, internal controls, funds flow, financial reporting, and auditing arrangements to ensure that they can readily provide accurate and timely information regarding project resources and expenditures. These arrangements are deemed acceptable if they (a) are capable of correctly and completely recording all financial transactions and balances relating to the project resources; (b) can facilitate the preparation of regular, timely, and reliable financial statements; (c) safeguard the project's assets; and (d) are subject to auditing arrangements acceptable to IDA. The assessment was conducted through discussions with the staff and review of the documentations of the implementing agencies.

2. The financial management assessment indicates that the project will be implemented in an inherently high-risk environment. During Phase II of the APL Program, the same financial management and disbursement arrangements will be applied that have been assessed as adequate. The project has been regularly supervised by the Bank and the financial management performances have been rated as "marginal satisfactory." All the audit reports (EdL Corporate Audit Report and two Project Financial Statements for EdL and MEM components) have been submitted late in the past, although the last audit reports for FY2008 were submitted within the Bank's deadline. The quarterly interim financial reports have been submitted regularly by MEM with comprehensive information, but EdL has not been able to achieve the same standard. However, all the overdue interim financial reports have been submitted by EdL recently. Appropriate mitigation measures have been incorporated into the design of the financial management arrangement that will reduce the residual risks of the project to be "moderate," including the following:

- (a) The financial management consultant currently engaged by the DOE will continue to be engaged to assist in day-to-day operation on all financial management aspects.
- (b) The audit of the MEM component will be included under the audit bundling exercise to ensure that an independent auditor will be engaged to conduct the audit of the project's financial statements.

3. In conclusion, the proposed financial management arrangements put in place by the MEM will meet the Bank's minimum requirements for project financial management as per OP/BP 10.02.

4. **Country Issues.** Since 2003, the GoL has been implementing robust Public Financial Management Reforms financed by a number of donors, including the Bank/IDA, which has been financing such reforms through the Financial Management Capacity Building Project. Component 1 of that project covers financial sector reform, focusing on: (a) improving data management; (b) on- and off-site examination of banking and other financial institutions; and (c) improvement of the credit information bureau of the Bank of the Lao PDR. Component 2 covers core Public Financial Management reforms such as: (a) stabilization of Government Financial Information System; (b) strengthening of debt management; (c) support to the procurement monitoring office; and (d) curriculum

strengthening at three regional Public Financial Management schools and upgrading training institutions. Component 3 covers state-owned enterprise reforms and business development, with a focus on: (a) development of business strategy; (b) state-owned enterprise restructuring; and (c) monitoring and evaluation. Under Additional Financing, the following components were later added: (a) development of a new intergovernmental fiscal framework; (b) implementation of revised chart of accounts; (c) support for centralization of Treasury functions; and (d) strengthening of external audit capacity. All of these reforms are anchored in the Government's Public Expenditure Management Strengthening Program, which guides key Public Financial Management reforms in the Lao PDR; it was approved by the MOF and the Prime Minister's Office and adopted by the GoL in November 2005.

5. The Public Expenditures Management Strengthening Program is a multiyear, medium- to long-term program that aims to improve policy consistency, efficiency, transparency, and accountability in public expenditure management by strengthening institutional systems and capacity, and moving the country forward appropriate international financial management standards. It provides a framework for implementing GoL policies and strategies laid out in the "Policy Paper on Governance," the National Growth and Poverty Eradication Strategy, and the National Socio Economic Guidelines 2006–2010. The program is a response to some of the key Public Financial Management weaknesses outlined in the Country Financial Accountability Assessment of 2002, which concluded that the overall fiduciary risk in the Lao PDR was high, and there was insufficient transparency in public financial management, despite the elaborate internal controls built into the Government Public Financial Management system. A combined Public Expenditure Review and Integrated Fiduciary Assessment for 2004/2005, completed in 2006 and disseminated in 2007, supported the findings of a weak accounting environment.

6. At the time of project preparation, the budget process in the Lao PDR remains insufficiently transparent, and public access to government financial information remains limited. These weaknesses have been compounded by insufficient awareness in the public sector of modern internal control practices, and by the GoL's ongoing decentralization initiative, which needs to be supported with a sufficiently robust institutional framework that clearly defines the new responsibilities at lower levels. Technical capacity of staff at these levels needs to be strengthened, and the oversight functions of the State Audit Organization needs improvement. Capacity at provincial and district level is also extremely weak. A recently completed Institutional Development Fund grant to improve accountability in state-owned enterprises and the private sector has helped develop the environment for the accounting and auditing professions, and initiated amendments to accounting and auditing laws.

7. The recent joint Portfolio Effectiveness Review undertaken by the government, ADB, the Swedish International Development Cooperation Agency, and the Bank also identified similar issues and weaknesses. As a result, the donors and the government agreed that a series of remedial measures would be implemented in a time-bound action plan, including: (a) the delegation of authority over the management of project-designated accounts to executing agencies that have in place adequate quality and control systems; (b) streamlining of approval processes; (c) harmonization of financial management manuals; (d) utilization of uniform financial management software; (e) consolidation of project financial management functions; and (f) implementation of a consolidated training program. A financial transactions review undertaken by the World Bank in May 2008 on selected projects and Trust Funds has also revealed a number of financial management weaknesses. For example, weaknesses in capacity, problems in accounting for fuel, allowances, and advances.

8. While the implementation of the actions above has improved specific fiduciary issues, it has yet to affect most ministries and departments. Thus, the country's financial management environment for externally funded projects, as well as for general public resources generated by government, remains weak.

9. One major problem is that the bulk of external assistance has been channeled off-budget both in the sense that resource allocations are not reflected in the government's budget documents, and that the related funds are not disbursed through the national treasury. This lack of information and absence of effective instruments to guide the allocation of external financing seriously undermines the integrity, creditability, and effectiveness of the budgetary system. The Financial Management Capacity Building Project and the formation of Government's master plan for reform of public financial management through the Public Finance Management Support Project aim at addressing these weaknesses by mobilizing funds from a number of development partners to finance a comprehensive overhaul of the public financial management systems.

10. A financial transactions review undertaken in 2007 revealed a number of project portfolio wide financial management weaknesses. A review of management letters issued on previous projects implemented in the province funded by the Bank, United Nations Development Programme, and other development partners point to a number of weaknesses in internal control, especially at the provincial level.

11. The 2007 Transparency International Corruption Perception Index ranks the Lao PDR at 163 out of 173 countries, compared to a ranking of 152 in 2006. The perception of corruption in the Lao PDR is that it may be worsening. This enhances the degree of perceived risk to the project.

B. Risk Analysis

12. The detailed risks to project funds and related mitigating aspects are as analyzed and articulated in Table 7-1.

Table 7-1: Risk Analysis

<i>Risk</i>	<i>Risk rating</i>	<i>Risk mitigation measures incorporated into project design</i>	<i>Risk after mitigation</i>
Inherent Risk			
<p>Country level: Governance issues have previously been identified (high country corruption index on the Transparency International Index) and hence there is a risk that funds may not be used in an efficient and economical way and exclusively for purposes intended.</p> <p>There is weak control environment with weaknesses in National Treasury operations, especially in cash management. There are inadequacies in Public Financial Management accounting system, and weak internal and external auditing capacity.</p>	H	<p>Appropriately qualified ministry staff assisted by a national financial management consultant will be managing the fiduciary aspects of the project. Internal control procedures will be documented in a procedure manual and staff will ensure those guidelines are adhered to.</p> <p>Training and capacity building programs will be used to continue to strengthen the implementation capacity.</p> <p>The treasury weaknesses and the generic public financial management inadequacies are being addressed through the Financial Management Capacity Building Project. Some of the core aspects in Public Financial Management reform such as establishing provincial internal audit capacity; biannual systems audits will be implemented. A total of five main public financial management reform items will be piloted through the project at provincial level. These will include budgeting, accounting, and application of Medium Term Expenditure Framework, internal audit and robust district, and provincial audit by independent external audit.</p> <p>Government-wide staff will be trained in Medium Term Expenditure Framework principles, treasury management, commitment control and debt management.</p> <p>Annual public expenditure reviews will be undertaken at provincial level to check on the weaknesses noted amongst other things.</p> <p>The Financial Management Capacity Building Project has clear achievement indicators in reforming and addressing the weaknesses noted. A provincial PEFA exercise will be undertaken when the project is three years old to check on the selected areas of Public Financial Management.</p>	S
Owing to low salary levels within public service, fuel, training, workshop costs, allowances, and other soft expenditures have become a means of livelihood and are a likely subject of abuse.	S	Compliance with fuel and allowance rules will be subject to review during each supervision mission and will also be checked by external auditors. Appropriate payment principles will be written in the project Financial Management Manual on soft expenditures. It is envisaged that financial management guidelines will be issued to help staff working on the project understand what is required of them.	M
Inability to use funds efficiently and economically for purposes intended.	S	There shall be enhanced accounting and reporting. Independent external auditors will be engaged to conduct annual audits. The project managers will oversee proper usage of funds every quarter upon production of the interim financial reports and will be reviewed by the Bank. Activities of each component shall be based on an agreed budget.	M

<i>Risk</i>	<i>Risk rating</i>	<i>Risk mitigation measures incorporated into project design</i>	<i>Risk after mitigation</i>
Entity Level: The project may be unable to find appropriately qualified staff to manage implementation.	S	EdL and MEM have extensive experiences in managing IDA-funded projects (SPRE, REP I, GMS Power Trade Lao Project). EdL has assigned enough financial staff to work on the project, but MEM has only one junior counterpart staff assigned to work closely with the financial management consultant. The financial management consultant will continue to be engaged to work on the proposed project.	M
Potential corruption arising from procurement.	H	ICB shall apply for all contracts above a certain threshold, and the Bank procurement rules shall apply. A review of indicative red flags for collusion will be periodically conducted. The phone number of the State Inspection Authority shall be provided in the bidding and Request for Proposal (RFP) documents, in addition to the contact address of the Bank's task team leader and also the Bank's Integrity Vice Presidency (INT) hotline. The public will be encouraged to report any suspected cases of corruption and collusion. The authority will investigate and bring charges against offenders to book upon obtaining evidence of malfeasance.	S
Overall inherent risk	H		S
Control risk			
Budgeting.	S	Budgets will be prepared annually and revised biannually. Financial budgets will be linked to physical outputs through the operating and procurement plans. The interim financial reports will be used to monitor variance analysis with budget.	M
Staffing—limited capacity.	S	Both EdL and MEM have extensive experiences in managing IDA-funded projects (SPRE, REP I, GMS Power Trade). EdL has assigned enough financial staff to work on the project, but MEM has assigned only one junior counterpart staff to work closely with the financial management consultant. The financial management consultant will continue to be engaged to work on the proposed project.	M
Inability to properly account for grants, advances, fuel and allowances.	S	An Advance Control Book and vehicle log book will be maintained for fuel usage by the project. These books will be reviewed during each mission and by the external auditors.	M
Inability to properly utilize the project resources and hold implementers accountable.	S	An annual budget will be prepared and closely monitored. The project will be closely supervised by the Bank task team. A low threshold will be set up for all types of activities that will require request for the Bank's No Objection.	M
Reporting and monitoring.	S	Reporting requirements and their timelines will be clearly spelled out in the Financial Management Manual. These will include quarterly unaudited interim financial reports (within 45 days after the end of each quarter) and annual audit report (within six months after the end of each fiscal year). The format of the progress reports will specify the linkages between physical and financial progress, and a monitoring and evaluation system will be established to capture the necessary information.	M

<i>Risk</i>	<i>Risk rating</i>	<i>Risk mitigation measures incorporated into project design</i>	<i>Risk after mitigation</i>
External Audit—the Supreme Audit Office is still developing its capacity and does not yet possess enough capacity to discharge its duties.	S	Annual audit of the project’s financial statements by independent external auditors will be conducted according to Terms of Reference satisfactory to the Bank. The audit of the EdL component will be financed by EdL itself, together with the audit of the Entity’s financial statements. The audit of the MEM component will be included in the audit bundling exercise currently being carried out by the MOF.	M
Overall control risk	S		M
Overall project risk rating	S		M

C. Financial Management Arrangements

13. **Implementation Arrangement.** The current arrangement for the implementation of REP I will be maintained. The project will be implemented by EdL and MEM jointly. EdL has established a project office at its headquarters and one construction team at each of its five branch offices. The project office will be responsible for overall management and control of the project execution and will maintain close coordination with MEM, IDA, and NORAD, while the branch offices will be responsible for implementation of the physical subprojects in the seven central and southern provinces.

14. The project management unit of MEM will be responsible for implementing the MEM component and coordination with EdL and donors. Because of the limited procurement and financial management capacities of the MEM project management unit and institutional constraints of being a government office, the implementation of the off-grid investment activities and associated social and environment management will be handed over to a third party—a consulting firm—through a management contract. This is the same approach that was taken under REP I for the off-grid investment activities. After the transition, MEM will oversee the Off-Grid Investment Program while continuing to implement all technical assistance activities associated with the MEM component, including procurement, financial management, and other technical assistance activities.

15. **Staffing.** The following staffing was arranged for financial management:

- (a) EdL—the same three counterpart staffs have been assigned to be responsible for financial management of the EdL component, including accounting and reporting functions. The currently installed Accounting and Financial Management System have been modified to enable the capturing of transactions by project activity, disbursement category, and source of funds to facilitate the production of the interim financial reports. However, the system is still not fully operational, the installation at the provincial level has not been successfully carried out, and the quarterly interim financial reports are still prepared manually.
- (b) MEM—the existing financial staff under the ongoing REP Phase 1 project will continue to be responsible for the financial management of MEM component, which consists of one financial management consultant assisted by one junior accountant (counterpart staff) and one cashier (contracted staff). The computerized accounting system developed in-house by the financial management consultant using Access software, which is currently in use by the ongoing REP Phase 1 project, will continue to be used to maintain the project accounting books for the proposed REP II.

16. **Accounting Policies, Procedures, and Information Systems.** *Financial Management Manual and Accounting Policies.* The Financial Management Manual developed by the financial management consultant currently in use by the ongoing REP I Project includes all key accounting policies and procedures, describing the flow of funds, the accounting policies and procedures, budgeting, recording, financial reporting, auditing, and disbursement arrangements. Once the Financial Management Manual and the Standard Operating Procedures for Overseas Development Aid, currently being developed under one of the Institutional Development Fund–supported projects funded by IDA in Lao, is announced by the MOF, the current Financial Management Manual will be updated to align with the new manual and will be modified to include the specific requirements of the proposed REP II to become a supplementary Financial Management Manual. The project will be accounted for on a cash basis. All accounting and supporting documentation will be retained by the Finance Unit of both implementing agencies in a system that allows authorized users easy access.

17. **Segregation of Duties.** Job descriptions and responsibilities for the financial staff are clearly defined. The segregation of duties will be enforced at all the times to ensure that no single person can initiate, verify and authorize a payment transaction.

18. **Payment.** Payments in cash will be minimized. In MEM, a petty cash float of US\$1,000 will be set up to facilitate the payment of small transactions. Any payment that exceeds US\$300 will be made by check. All consultants will be requested to open a bank account at a commercial bank, and payments will be made directly to the consultants' bank accounts. Two signatures are required for each check or bank transfer. The procedures and controls of payments will be described in details in the supplementary Financial Management Manual. Since no incremental operating costs will be financed to EdL, no petty cash fund will be required.

19. **Safeguard over Assets.** A fixed asset register is required to be maintained by the procurement staff, including all necessary information. The register will be reconciled with the books of account by the financial staff to ensure the completeness and accuracy of the register. A physical inventory of all fixed assets will also be conducted by the parties concerned at least once a year to verify the existence and check the status of the fixed assets. The team may consist of procurement staff, financial staff, and users, as well as the internal auditor (for EdL) or the inspection staff (for MEM).

20. **Budgeting.** The government budgets as currently prepared do not lay down physical and financial targets. However, budgets are prepared for all significant activities in sufficient detail to provide a meaningful tool to monitor subsequent performance. Actual expenditures are normally compared to the budget every quarter and explanations are obtained for significant variations from budget. Approvals for variations from budget are required to be obtained in advance.

21. Existing procedures will also be adopted for the project. An Annual Work Plans will be prepared by the implementing agencies in coordination with other sector agencies and will be consistent with the national policies and overall strategies for the country, as well as with available resources. The Annual Work Plans will outline all significant activities in sufficient details; an activity code will be assigned for each activity and will be referred to when a payment or advance is requested. The Annual Work Plans will be submitted to IDA for discussion on an annual basis and will be reviewed and revised biannually.

22. **Funds Flow and Disbursement Arrangements.** The project proceeds from the IDA grant will be drawn from the Bank and deposited into two designated accounts to be managed by the MOF. The Designated Accounts will be used to make payments for eligible expenditures under agreed disbursement categories of the project. Payments in cash will be limited to petty cash transactions only. Direct payments to suppliers and consultants will be used for expenditures above the minimum application size set up in the Disbursement Letter. Advances on an activity base (which mainly will be

carrying out monitoring and supervision field trips will be liquidated not later than 10 days after completion of activity. Further advances will not be made unless the previous advance has been cleared. EdL and MEM will be responsible for certifying and verifying expenditures incurred at various implementation levels. The EdL Internal Audit Department will check internal controls and verify a sample of key expenditures.

23. Grant disbursements will be done by the traditional transaction-based method, using the designated account for mainly small expenditures, with replenishment on the basis of a statement of expenditure; reimbursement for eligible expenditures pre-financed by the government; the direct payment method for expenditures above the levels for statements of expenditure with full documentary support. Special Commitments may also be used for expenditures covered by Letters of Credit. Withdrawal application will be submitted and indicate clearly how much project expenditures will be claimed under each category.

24. **Designated Account.** To facilitate disbursement of the project proceeds, a separate designated account will be established by each implementing agency. The payment of the project proceeds will be handled as shown in Table 7-2.

Table 7-2: Designated Account

<i>Implementing agency</i>	<i>Designated account</i>
EdL	IDA-DA of US\$500,000
MEM	IDA-DA of US\$50,000 For major contracts for goods financed under an IDA grant, the payment will be made via direct payment.

25. The Designated Accounts, denominated in U.S. dollars, will be opened at the Bank of Lao. The Designated Accounts should include appropriate protection against set-off, seizure, and attachment. The Designated Accounts for EdL and MEM will have authorized allocations of US\$500,000 and US\$50,000, respectively. These levels of allocation are considered to be adequate for project startup, given the use of direct payment wherever possible. As the project progresses, the need for increased the authorized allocation will be assessed, taking into account the impact on the flow of funds through the Designated Accounts. Although the Designated Accounts will be administered by the MOF, day-to-day management and replenishment to the Designated Accounts will be handled by the implementing agencies for expenditures incurred under all components. The Designated Accounts should be replenished on a monthly basis (irrespective of the amount involved) to assure liquidity of funds. All replenishment applications will be accompanied by reconciled bank statements from the depository bank showing all transactions through the Designated Accounts. The designated account will be audited annually by an independent external auditor acceptable to the Bank.

26. **Allocation of Grant Proceeds.** REP II would be implemented over a four-year period, starting from January 2010 and completed by December 2013. REP II is financed by the second tranche of an IDA grant under the IDA Adoption APL, with an IDA grant of US\$20 million, an ESMAP grant of US\$0.5 million, and co-financing of US\$4 million from NORAD. Even though all project expenditures will be financed 100 percent by the project, complementary financing will also come from contributions by EdL, MEM/REF, and customers. The allocation of grant proceeds against eligible expenditures is outlined in Table 7-3.

Table 7-3: Allocation of Grant Proceeds

<i>Category</i>	<i>IDA grant (US\$)</i>	<i>Percentage to be financed</i>
Goods		100
Under MEM	4,000,000	
Under EdL	15,800,000	
Incremental Operating costs		100
Under MEM	100,000	
Under EdL	100,000	
TOTAL	20,000,000	

27. **Supporting Documents for Disbursement.** The following will be required for reporting eligible expenditure paid from the Designated Accounts and requests reimbursement:

- Statements of expenditure will be accepted for the following expenditures: (a) goods costing less than US\$100,000 equivalent per contract; (b) services by consulting firms costing less than US\$100,000 equivalent per contract; (c) services by individual consultants costing less than US\$50,000 equivalent per contract; and (d) all training, workshops, and incremental operating costs.
- Full documentation including reports evidencing eligible expenditures; for example, signed contracts and invoices will be required for any expenditure exceeding the above limits and any prior review contract.

28. Application for direct payments will require, purchase records evidencing eligible expenditures (such as copies of contracts, purchase orders, suppliers' invoices, and receipts) and will need to be submitted together with Withdrawal Applications setting out clear payment instructions. Withdrawal applications will be prepared by the implementing agencies and submitted for review and signed by the MOF before submission to the Bank.

29. The related documents shall be retained by the project during the life of the project and until at least the later of: (a) one year after the GoL and the Bank have received the audited financial statements covering the period during which the last withdrawal from the Financing Account was made, or (b) two years after the project closing date. These documents will be made available for required audits, as well as to the Bank supervision missions upon request.

30. Should the auditors or the IDA's supervision mission find out that disbursement have been made that are not justified by supporting documentation, or are ineligible, the IDA will have the right to withhold further advances to the Designated Account. The IDA may exercise this right until the Recipient has refunded the amount involved or, if IDA agrees, has submitted evidence of other eligible expenditures that offset the ineligible amounts.

31. **Reporting and Monitoring.** The reporting requirements will be the same as REP I. The unaudited quarterly interim financial reports will be prepared by each implementing agency on Cash basis. Because the interim financial reports will also used as a monitoring tool, they will summarize project progress and provide variances analysis; financial statements on sources and uses of funds, project financial position; expenditures and physical progress compared with plan; and procurement and contract monitoring reports. The interim financial reports should also provide a linkage between the physical progresses to financial information. Such reports will be prepared on a timely basis and be submitted to the Bank within 45 days after the end of each quarter starting from the end of the first quarter after disbursements begin. The format of the interim financial reports will be the same as the

current ones under REP I. Additional output monitoring and performance indicators will be developed to suit the project needs during implementation.

32. **Internal Control and Internal Audit.** EdL: Technical assistance has been provided under REP I for on-the-job training with EGAT in Thailand. However, the experienced staffs have been moved to undertake other responsibilities. Currently EdL’s Internal Audit Department consists of internal audit staff, mostly with strong operational backgrounds. Further technical assistance will be provided under REP II in relation to training courses on internal controls and good practice for internal audit functions. It has been agreed that internal audit work will extend to this project. The Internal Audit Department will audit the proposed REP II at least twice a year, and the internal audit reports will be provided to the Bank two months after the review.

33. MEM: There is no internal audit function—only the Inspection Department under MEM. The capacity is low, and the current scope of tasks does not cover the financial audit of donor-funded projects—it only covers physical inventory of the ministry’s fixed assets. The MOF is planning to establish an internal audit government-wide soon. The compensating control will be tight control over approval, close supervision by the Bank’s task team, including a low threshold for all types of activities that require request for no objection from the Bank.

34. **External Audit.** All government ministries and departments are supposed to be audited by the Supreme Audit Office under the new audit law. However, at the moment the Supreme Audit Office only does compliance audits because of its limited capacity. As such, an external auditor, satisfactory to the Bank, will be required to conduct the audits in accordance with International Standards on Auditing, under term of reference satisfactory to the Bank. The auditor will be required to: (a) express an independent audit opinion on the annual project financial statements for each year from inception of the project; and (b) assess the extent of compliance with the provisions of the underlying funding agreements. A separate management letter will also be submitted that will report on material weaknesses in accounting and internal controls; the degree of compliance with the financial covenants in the funding agreements; and any matters that have come to the attention of the auditors that might have a significant impact on the implementation of the project. The audited financial statements and audit reports will be submitted to the Bank within six months after the end of each fiscal year.

35. EdL has engaged KPMG as its external auditor for the period 2008–10 to conduct the annual audit of EdL’s Corporate Financial Statements and the Project Financial Statements for the EdL component. EdL will finance the audit fees for these audit reports from its own sources. Table 7-4 summarizes the audit requirements for the project.

Table 7-4: Audit Requirements

<i>Implementing agency</i>	<i>Required audit reports</i>
EdL	Financed by EdL: (1) EdL corporate financial statements (2) Project financial statements for EdL component
MEM	Financed by project proceeds: (1) Project financial statements of MEM component

36. **Supervision Plan.** Since the financial management overall risk is assessed as substantial and reduced to moderate after mitigation, supervision of project financial management will be done at least twice a year. The supervision will review the project’s financial management systems, including but not limited to operation of designated accounts, evaluating quality of budgets, project financial management reports, assessing relevance of financial management manual, statements of expenditure, internal

controls, reporting and follow up of audit and mission findings. The review will also include random reviews of financial statement concentrating on per diems, training, and workshop costs, fuel and accommodation expenses, and compliance with covenants. It will also involve visits to various sites and physical verification of assets bought by the project. Each supervision mission will assess the project's financial management risks and the frequency of future supervision will be adjusted if necessary.

37. **Financial Management Action Plan.** The following action plan (see Table 7-5) will address identified weaknesses:

Table 7-5: Financial Management Action Plan

<i>No.</i>	<i>Action</i>	<i>Responsible</i>	<i>Completion</i>
1.	The current financial management consultant will continue to be engaged to work on REP II.	DOE	By effectiveness
2.	An external auditor will be appointed for the MEM component.	DOE/MOF	Already carried out by MOF

Annex 8: Procurement Arrangements

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in Support of the Rural Electrification (APL) Program

A. General

1. Procurement of goods and works under REP II financed in whole or in part by IDA funds will be carried out in accordance with IDA's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004, revised October 2006; and procurement of consultant services financed in whole or in part by IDA funds will be carried out in accordance with IDA's "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, revised October 2006, and the provisions stipulated in the Legal Agreements. The various items under different expenditure categories are described in general below. For each contract to be financed by the IDA grant, the different procurement methods or consultant selection methods, estimated costs, prior review requirements, and time frame are agreed between the Recipient and the IDA in a Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

2. **Procurement of Goods.** Contracts for Goods to be procured under REP II and expected to be financed from IDA funds will include (a) power distribution equipment and materials, such as overhead conductors, transformers, meters, poles and associated fittings, and accessories; (b) field work vehicles and construction equipment, special installation tools; (c) office equipment; (d) loss-reduction-needed equipment, such as meters, calibration and testing equipment, monitoring instruments, and substation spot metering equipment; (e) SHS units including installations; and (f) village hydro and generator sets.

3. Contracts for goods estimated to cost US\$100,000 equivalent or more each shall be procured through ICB using the Bank's applicable standard bidding documents. Goods estimated to cost less than US\$100,000 equivalent per contract may be procured through NCB method and the procedures set forth in the Government's Decree 03/PM dated January 9, 2004, and in the Implementing Rules and Regulations dated March 12, 2004, including the national standard bidding document with Bank's prior concurrence, will be followed subject to the improvements listed in the NCB-Annex to the Legal Agreement. Goods estimated to cost less than US\$30,000 per contract may be procured through the Shopping method and the procedures, including standard bidding documents, set forth in the aforesaid decree and in the Implementing Rules and Regulations. All direct contracts, if any, will be subject to prior review by the Bank.

4. **Procurement of Works.** The installation and erection works will be performed by EdL's own construction force (or subcontracted by EdL to qualified local contractors). No works are expected to be financed by IDA funds.

5. **Selection of Consultants.** At this time no contracts for consulting services are expected to be financed by IDA, since they will be financed by NORAD. However, for possible future contracts for consultant services that may be financed by IDA, consultant firms will be selected through Quality- and Cost-Based Selection (QCBS), Quality-Based Selection (QBS), or Selection Based on Consultants' Qualifications (CQS) procedures, depending on the specific consulting assignment; and Single-Source Selection (SSS) procedures may be followed, if justified, in line with the Consultant Guidelines and subject to the prior approval of the Bank. Shortlists of consultant firms for services estimated to cost less than US\$100,000 equivalent per contract may comprise entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. Individual consultants may be

selected in accordance with the provisions of paragraphs 5.1 to 5.4 of the Consultant Guidelines. Under the circumstances described in paragraph 5.4 of the Consultant Guidelines, such contract may be awarded to an individual consultant on a sole-source basis, subject to the prior approval by the Bank.

B. Assessment of the Agency's Capacity to Implement Procurement

6. An assessment of the procurement capacity of the implementing agencies was carried out by IDA procurement staff in accordance with relevant guidelines. The assessment report is available in the project files.

7. Procurement activities will be carried out by EdL (a wholly state-owned enterprise) for the EdL Component and by the DOE under MEM (a central government ministry) for the MEM Component under the project.

8. Under REP I, the procurement of goods, works, and consultant services has been carried out by EdL through its Project Management Unit, which was set up since SPRE project and located at EdL's head office and coordinated with concerned technical departments on each project component, such as the Loss Reduction and Demand-Side Management and Energy Efficiency Program components. The Project Management Unit includes one project manager and two deputy managers, to be supported by about ten full time professional staff of EdL at the EdL head office. The Project Management Unit is responsible for overall coordination, procurement, monitoring and reporting and other management. Both the Project Management Unit and the technical department staff have acquired extensive experience in carrying out procurement following IDA's procurement procedures under previous projects (REP I, SPRE). This arrangement has worked well for procurement under REP I, and EdL is considered to have adequate capacity to carry out the procurement under the EdL component of REP II. Further refresher training will be provided by the Bank before and during project implementation.

9. The off-grid procurement activities will be carried out by the DOE under MEM. The DOE has under REP I been carrying out procurement through an ad hoc arrangement through support provided by the project manager assisted by the finance consultant. However, this is not a sustainable arrangement, and it has been agreed that the DOE will engage a full-time international procurement consultant for its Project Management Unit for at least one year to assist the DOE in carrying out procurement under the MEM Off-Grid Investment component of REP II, as well as under REP I and its additional financing. This international procurement consultant will also provide procurement capacity building to MEM staff to enable them to independently undertake procurement in the future.

10. Two main procurement risks are identified: (a) the general weak procurement environment in the country; and (b) procurement delays particularly because of the DOE's weak procurement capacity. However, these risks will be mitigated, since practically all procurement financed by IDA will be procured through ICB procedures, and the nature of the procurement would also generally require goods to be supplied from abroad mostly through international suppliers. The technical specifications for most of the equipment have also been generally standardized. An international procurement consultant is being engaged by the DOE to assist in carrying out procurement under MEM's off-grid investment subcomponent and also to build procurement capacity of the DOE staff, which will also help reduce delays.

11. The overall procurement risk is rated as "Moderate," because: (a) EdL, which has extensive experience in IDA-funded ICB procurement and has satisfactorily carried out past procurement under REP I, will handle the majority of procurement under REP II; and (b) an international procurement consultant is being engaged to assist the DOE in its procurement and also to build procurement capacity.

C. Procurement Plan

12. EdL and MEM have developed a Procurement Plan for the whole project period with detailed procurement arrangements. This plan has been reviewed by IDA agreed at the negotiations. The agreed plan is made available at EdL Project Office and MEM Project Management Unit as well as the IDA project file. It will be available in the project's database and in IDA's external website. The plan will be updated in consultation with IDA, annually or as required, to reflect changes in implementation needs and improvements in institutional capacity.

D. Frequency of Procurement Supervision

13. In addition to prior review, the Procurement Capacity Assessment Report has recommended that procurement supervision missions take place at least twice per year for post review of procurement activities and discussions on solutions to procurement-related issues.

E. Complaints Handling Procedures

14. According to the Government Procurement Implementation Rules and Regulations (dated March 12, 2004), the following procedures should be followed to handle procurement complaints:

- (a) Written complaints with proper evidence should be filed with the Chairman of Procurement Committee.
- (b) The Procurement Committee should respond to the complainant within 14 working days and, if necessary, contract award may be suspended and all bidders are informed accordingly.
- (c) Bidders may refer to the MOF/Procurement Monitoring Office if no proper resolution has been received from the Procurement Committee (a resolution/decision should be given within 14 working days).
- (d) In principle, contract award should be withheld until a complaint is satisfactorily solved. However, the Chairman of Procurement Committee may justify continuation of the procurement process by reasons of urgent necessity. The justification must be sufficiently supported and notified to the complainant within seven working days; otherwise, the contract award decision will be considered as null and void.
- (e) Complaints after contract award will be reviewed by the Procurement Committee, and a report should be submitted to the State Inspection Authority in the Prime Minister's Office and MOF/Procurement Monitoring Office.

15. Disputes resolution procedures and court proceedings are also provided in the government procurement rules and regulations.

16. The following sanctions are also provided in the GoL's procurement Implementing Rules and Regulations: (a) breaching of procurement rules and regulations will be subject to warnings, administrative and disciplinary actions according to the civil service rules and relevant laws; (b) criminal proceedings will take place if the misconduct is so warrant (such as falsification of documents, abuse of authority, negligence in performance of duties); (c) collusion and manipulation of contract award will be subject to court proceedings and punishment according to the law; (d) contracts awarded not in full compliance with the bidding procedures and procurement rules and regulations or lack of transparency will be considered null and void; and (e) any bidder offering or promising material or other rewards directly or indirectly to procurement committee or other individuals in the procurement decision making may be disqualified, and court proceedings may be instituted.

F. Details of Procurement Arrangements for Items to Be Procured

17. Contracts under the procurement plan for goods and services are summarized in Table 8-1.

18. **Procurement of Goods.** All contracts estimated to cost US\$100,000 or more per contract will be subject to IDA prior review.

Table 8-1: Goods and Civil Works

1	2	3	4	5	6	7	8	9
<i>Ref. no.</i>	<i>Contract (description)</i>	<i>Cost estimate (US\$m)</i>	<i>Procurement method</i>	<i>Pre-qualification</i>	<i>Domestic preference (yes/no)</i>	<i>IDA review</i>	<i>Bid opening date</i>	<i>Comments</i>
A.1 Grid Extension Component (EdL)								
REP II 1/1	Overhead conductors		ICB	No	Yes	Prior	May 2010	IDA
REP II 1/2	Distribution transformers		ICB	No	Yes	Prior	June 2010	IDA
REP II 1/3	Watt hour meters and meter boxes		ICB	No	Yes	Prior	June 2010	IDA
REP II 1/4	Concrete poles		ICB	No	Yes	Prior	May 2010	IDA
REP II 1/5	Distribution transformer fitting material		ICB	No	Yes	Prior	June 2010	IDA
REP II 1/6	Distribution line materials		ICB	No	Yes	Prior	June 2010	IDA
REP II 1/7	Office equipments		ICB				June 2010	IDA
REP II 1/8	Concrete cross arms		ICB	No	No	Prior	June 2010	IDA
REP II 1/In	Installation		-	-	-	-	Sep 2010	EdL
A.2 Loss Reduction Program (EdL)								
01	Capacitors, meters and instruments		ICB	No	Yes	Prior	July 2010	IDA
A.5 DSM and EE								
01	Computers, office equipment, materials for camping, etc.		Shopping	No	No	Post	July 2010	IDA, Multiple contracts
B.1 Off-Grid Investment Program (MEM)								
01	SHS units Pico-hydro units		ICB	No	Yes	Prior	June 2010	IDA, Separate contracts
B.5 Organizational Strengthening of MEM								
02	Computer, office equipment		Shopping	No	No	Post	July 2010	IDA, multiple contracts

19. **Consulting Services.** Consultancy services estimated to cost US\$100,000 or more per contract and all Single Source Selection of consultants (firms), and US\$50,000 or more and sole source selection for individuals will be subject to prior review by IDA. Shortlists of consultant firms for services estimated to cost less than US\$100,000 equivalent per contract may be made up entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

Table 8-2: Consulting Services

1	2	3	4	5	6	7	8	9
<i>Ref. no.</i>	<i>Contract (description)</i>	<i>Cost estimate (US\$m)</i>	<i>Procurement method</i>	<i>Pre-qualification</i>	<i>Domestic preference (yes/no)</i>	<i>IDA review</i>	<i>Bid opening date</i>	<i>Comments</i>
A.1 Grid Extension (EdL)								
REP II 1/Sv	Supervision of implementation		-	-	-	-	Aug 2010	NORAD
A.2 Loss Reduction (EdL)								
02	Technical assistance for loss reduction		-	-	-	-	July 2010	NORAD
A.3 Information Technology System and Financial Management (EdL)								

1	2	3	4	5	6	7	8	9
Ref. no.	Contract (description)	Cost estimate (US\$m)	Procurement method	Pre-qualification	Domestic preference (yes/no)	IDA review	Bid opening date	Comments
01	Modification and Maintenance of Information Technology system, financial management training		-	-	-	-	June 2010	NORAD
A.4 Safeguard Capacity Building (EdL)								
01	Training		-	-	-	-	June 2010	NORAD
02	Environment monitoring equipment, office equipment, training		-	-	-	-	July 2010	NORAD
A.5 Demand-Side Management and Energy Efficiency Program (EdL)								
02	Consulting services and training for DSM and EE		-	-	-	-	June 2010	NORAD
B.2 Institutional Strengthening (MEM)								
01	Consulting service for management of off-grid program		-	-	-	-	June 2010	NORAD
B.3 Alternative Rural Electrification Delivery Models (MEM)								
01	Consulting services for bio-energy and micro hydro promotion		-	-	-	-	June 2010	NORAD
B.4 Rural Electrification Master Plan and Database (MEM)								
01	Operation and maintenance of rural electrification database		-	-	-	-	June 2010	NORAD
B.5 Organizational Strengthening of MEM								
01	Consulting services for operation of REFS and project management unit		-	-	-	-	June 2010	NORAD

20. IDA Prior Review Thresholds

Table 8-3: IDA Thresholds for Prior Review

Expenditure category	Contract value threshold (US\$ '000)	Procurement method	Contracts subject to prior review (US\$ '000)
Goods	>=100	ICB	>=100
	<100	NCB	
	<50	Shopping	
Consultant services	>=100	QCBS, QBS	>=100 for firms All SSS
	<100	CQS	
	NA	IC	>=50 for individuals and sole source selection

Note:

ICB: International Competitive Bidding
 NCB: National Competitive Bidding
 DC: Direct Contracting
 QCBS: Quality- and Cost-Based Selection
 QBS: Quality-Based Selection
 CQS: Selection Based on Consultant's Qualifications
 IC: Individual Consultants
 SSS: Single-Source Selection

Annex 9: Economic and Financial Analysis

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in support of the Rural Electrification (APL) Program

A. Economic Analysis

A.1. Summary of Economic and Financial Analysis—Project Costs and Benefits

1. **Summary Economic Analysis.** At a 10 percent discount rate, the economic benefit for the grid extension subcomponent is estimated at a NPV of US\$84.49 million; and for the off-grid SHSs, the economic benefit per SHS ranges from the NPV of about US\$209 to US\$313, depending on the size of the system. Key findings are summarized in Table 9-1.

Table 9-1: Summary of Economic Analysis

	<i>NPV (US\$)</i>	<i>Benefit/cost ratio</i>	<i>Economic internal rate of return (%)</i>
Grid connection	84.49 million	2.80	80.77
Off-Grid SHS			
20 Wp system	253.71 per SHS	1.84	41*
30 Wp system	209.06 per SHS	1.55	23
40 Wp system	268.30 per SHS	1.59	22
50 Wp system	313.58 per SHS	1.61	22

* A large difference in economic internal rate of return between small and large SHSs is because the larger SHSs, especially the 50 Wp system, which cost twice as much as the 20 Wp system (US\$237/system versus US\$468 system), but consumer surplus gain from using 20 Wp system is US\$90/year versus US\$134 from 50 Wp system.

2. **Summary Financial Analysis.** Financial analysis for the grid extension component reveals that under the current subsidy arrangement and tariff regime, the grid extension component will have a NPV of US\$4.39 million at a 10 percent discount rate, and the off-grid investment subcomponent, ranging from US\$43.77 to US\$200.13 per SHS (see Table 9-2).

Table 9-2: Summary of Financial Analysis

		<i>NPV (US\$)</i>	<i>Benefit/cost ratio</i>	<i>Financial internal rate of return (%)</i>
Grid Connection	With capital subsidy	4.39 million	1.14	14.76
Off-Grid (SHS)				
	20 Wp System with 100% capital subsidy	43.77 per SHS	1.51	-14
	30 Wp System with 100% capital subsidy	90.14 per SHS	2.05	-29
	40 Wp System with 100% capital subsidy	148.89 per SHS	2.82	-62
	50 Wp System with 100% capital subsidy	200.13 per SHS	3.34	N/A

3. Recognizing the importance of rural electrification in poverty reduction and social development in rural areas and the fact that rural households are paying less than cost recovery for electricity supply, the government will provide 80 percent of the IDA grant proceeds to EdL, also in grant, to subsidize the capital cost of the grid extension component and allow EdL to keep dividends from export hydropower plants to subsidize its operation cost. The Sustainability Action Plan, including a tariff adjustment over the period 2005–11 under implementation now is designed to gradually phase out EdL's reliance on the dividends by the end of REP in 2011. For the IDA-supported Off-Grid Investment Program, the GoL will provide funds 100 percent in grant to MEM for the capital cost, and customer repayments will be sufficient to cover operating and maintenance costs.

4. The significant differences between the economic and financial returns for both the grid extension and off-grid rural electrification are largely the result of very high consumer surpluses, of

which the calculations are based on lighting intensity for both cases. While grid electricity consumers are paying LAK 3.32 per kilo-lumen hour, rural households without access to grid electricity are paying LAK 4,628 per kilo-lumen hour with candles, diesel lamps, and hurricane lanterns (63 percent of un-electrified rural households), or LAK 2,183 per kilo-lumen hour with candles, diesel lamps, and car/motorcycle batteries (31 percent of un-electrified rural households). Based on the price per kilo-lumen of each lighting energy sources and the respective kilo-lumen consumed by the household, the gross consumer surplus per household per year for those with a grid connection is estimated at LAK 3.5 million (US\$412). Gross consumer surplus for those with SHSs ranges from US\$90 to US\$134 per household per year (see Section C).

5. **Assumptions and Data Sources.** Major assumptions and sources of data are as follows:

(a) Grid Extension Subcomponent

- (i) *Capital Cost.* For the grid extension subcomponent, total investment cost is estimates at US\$22.85 million, including the costs of supervision, installation, consumer payment for in-house wiring, and contingencies.
- (ii) *Capital Subsidy.* Capital subsidy from the GoL includes 80 percent of the IDA grant allocation (US\$14.6 million) for the grid extension subprojects.

(iii) Cost of Supply

- For economic analysis of grid extension subcomponent, the total supply cost is based on the average cost (capacity, energy, and operation and maintenance cost) of electricity supply to all categories of consumers. The EdL tariff study prepared for REP II calculates the avoid cost of US\$0.0395/kWh for supply through EdL's own grid and US\$0.076/kWh for electricity import from EGAT system.
- Financial analysis of grid extension subcomponent is based on EdL's own supply cost at US\$0.0395/kWh.

(iv) Electricity Supply

- Total electricity sold to household customers is calculated from the total number of household connections targeted for REP II and household survey data on electricity consumption of rural households electrified by the three previous rural electrification projects financed by the World Bank. The household surveys reveal that the average electricity consumption per household is 55 kWh per month during the first three years, 62 kWh per month in the fourth and fifth years, and around 68 kWh per month after the fifth year. Therefore, the average monthly consumption per household is assumed at 63 kWh per month.
- The total amount of electricity sold to non-household customers is based on empirical evidence from EdL, which reveals that electricity sold to non-household customer is estimated to be 2.1 times the electricity sold to each household customer, that is, weighted household, or $27,700 \times 2.1 = 58,170$ households. For every monthly 63 kWh sold to each household customer, about 132 kWh (63×2.1) are sold each month to a non-household customer. As a result, it is assumed that about 44.19 million kWh are sold each year to non-household customers ($58,170 \times 63 \times 12$).
- Target connection is assumed at 20 percent during the first year (2010) and 50, and 30

percent during the second and third years; and electricity consumption is expected to increase at 10 percent compounded each year for five years starting from the fourth year (2013) and keep constant for the rest of the project life.

(v) *Economic Benefit*

- The economic benefit for household customers is based on a consumer surplus of household demand for electric lighting (see detailed explanation in the consumer surplus section).
- The economic benefit for irrigation and industrial customers (non-household customers) is assumed to be the cost of their cheapest source of energy, which is electricity. Therefore, economic benefit is assumed to be the same as electricity consumption multiplied by the electricity tariff.

(vi) *Tariff*

- The average tariff used for each type of customer is based on the Tariff Adjustment approved by the GoL on June 24, 2005 and made effective on July 1, 2005. For household customers the average tariff is based on weighted average of all the three blocks of tariff levels as specified in the Tariff Adjustment. The proportion of household fall in each tariff block is based on the survey data of households electrified by the previous RE projects financed by the World Bank, and the survey data is used as the baseline data for the REP I and REP II. There are 12 percent of the household falls into in the first block, 84 percent in the second block and 4 percent in the third block.

**Table 9-3: Detailed Tariff Adjustment Approved
by the Former Ministry of Industry and Handicraft (now MEM), 2005
(Lao kips)**

	2004	2005	2006	2007	2008	2009	2010	2011	Average annual increase (%)
Residential consumers									
First Block (0–25 kWh/month)	113	115	132	152	175	201	231	266	15
Second Block (26–150 kWh/month)	265	265	273	281	290	298	307	316	3
Third Block (>150 kWh/month)	765	765	765	765	765	765	765	765	0
<i>Average</i>	380	414	423	431	440	451	464	478	2.10
Nonresidential consumers									
Agriculture	295	295	310	325	341	359	377	395	5
Government	706	706	696	686	677	667	658	649	-1.40
Industry	636	636	627	618	610	601	593	584	-1.40
Commercial	826	826	826	826	826	826	826	826	0
International organizations	1066	1066	1066	1066	1066	1066	1066	1066	0
Entertainment	1095	1095	1095	1095	1095	1095	1095	1095	0
<i>Average</i>	663	683	678	672	668	663	659	655	-0.58
Medium Voltage									
Agriculture		251	263	276	290	305	320	336	
Government		600	592	583	575	567	559	551	
Industry		541	533	526	518	511	504	497	
Commercial		702	702	702	702	702	702	702	
<i>Average</i>		604	598	591	584	577	571	565	
<i>Nonresidential average</i>		668	662	657	652	647	643	638	
Total average		543	546	550	552	556	560	565	

Note: All figures are in real terms at 2004 price levels.
Source: MIH Notice 302, issued on June 24, 2005.

(b) Off-Grid Investment Subcomponent

- (i) The total cost for the off-grid investment subcomponent is based on cost per completed system, including installation cost. The operation and maintenance cost is estimated to be 10 percent of the system cost per year. For the off-grid investment, all capital cost is fully subsidized by the GoL with the IDA grant.
- (ii) The total economic benefit for the off-grid investment subcomponent is based on the consumer surplus of household demand for lighting energized by SHS (see detailed explanation in the consumer surplus section).
- (iii) The total financial benefit or loss for the off-grid investment subcomponent is based on consumer's monthly repayments (10-year repayment plan).

C. Consumer Willingness and Ability to Pay

6. Consumers' willingness and ability to pay for grid electricity appears to be very high. The household survey reveals that the average monthly spending for lamp lighting among un-electrified households in the project areas is estimated at LAK 16,963 (US\$2.00), while the average monthly spending for electric lighting—excluding other appliances—among electrified households is only LAK 1,532 (US\$0.18).⁸

7. In the case of off-grid electrification, consumer willingness and ability to pay is also high. However, ability and willingness to pay among poorer consumer groups—in the proxy baseline—is slightly lower. The household survey reveals that average monthly spending of un-electrified households that use only candles and diesel lamps for lighting is estimated at LAK 12,302 (US\$1.45). However, the monthly charge for the two smallest SHSs—20 Wp and 30 Wp—are LAK 13,000 and LAK 18,000, respectively. It is expected that many of these households may choose the 10-year option. For better-off consumers (that is, households that use candles, diesel lamps, and car or motorcycle batteries), the average monthly spending is estimated at LAK 25,381 (US\$2.99). This amount of monthly spending is close to the required monthly repayment for the 40 Wp and 50 Wp SHSs, which are LAK 24,000 and LAK 30,000, respectively.

D. Consumer Surplus

8. Gross consumer surplus per household per year for those with grid connection is estimated at LAK 3.5 million (US\$412). However, gross consumer surplus for those with SHSs ranges from US\$90 to US\$134 per household per year (see Table 9-4).

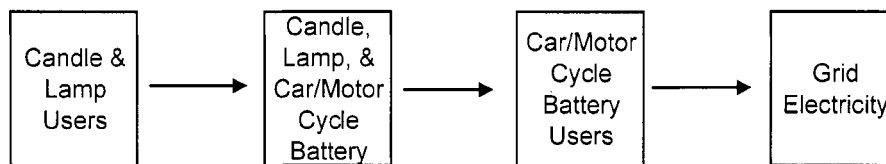
Table 9-4: Consumer Surplus—Gross Benefit

	Benefit/year/household (US\$)
Grid Connection	411.66
<i>Off-Grid (SHS) 20 Wp</i>	90.27
30 Wp	95.43
40 Wp	117.52
50 Wp	134.19

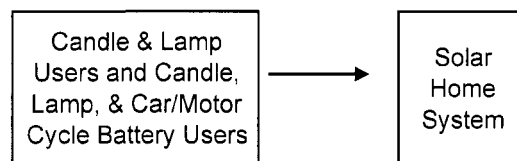
⁸ The average monthly spending for electricity—including electric lighting and all other appliances—is estimated to be LAK 10,895 (US\$1.28). The total monthly electricity consumption is 63.3 kWh, and electricity used for lighting accounts for approximately 23 percent of total electricity usage per month.

9. *Assumption and Sources of Data* for estimation of consumer surplus are as follows:

- (a) Household survey data collected during the Phase I project preparation are used to calculate consumer surplus for both grid and off-grid consumers. The survey was conducted among un-electrified households in the REP I areas and among electrified households that have been electrified under the three previous World Bank–financed projects in the central and southern regions of the Lao PDR.
- (b) Based on the survey data, un-electrified households in the project area can be classified into three groups:
 - Candle, simple wick lamp, and hurricane lantern users.
 - Candle, wick lamp, hurricane lantern, and car or motorcycle battery users.
 - Car or motorcycle battery users.
- (c) Based on the survey data, households for the proxy baseline group for off-grid investment subcomponent can be classified into two groups:
 - Candle, simple wick lamp, and hurricane lantern users; and
 - Candle, wick lamp, hurricane lantern and car or motorcycle battery users.
- (d) Analysis of consumer surplus benefits for grid electricity is based on the combined benefits of households moving three steps to grid electricity:



- Candle and lamp users moving one step to candle, lamp, and car or motorcycle battery.
 - Candle, lamp, and battery users moving one step to car or motorcycle battery only.
 - Car or motorcycle battery users moving one step to grid electricity.
- (e) Analysis of consumer surplus benefits for those with off-grid electricity (SHSs) is based on the average benefits of two consumer groups who move directly to SHSs. This is because the baseline data of un-electrified households consist of only two types of consumers:

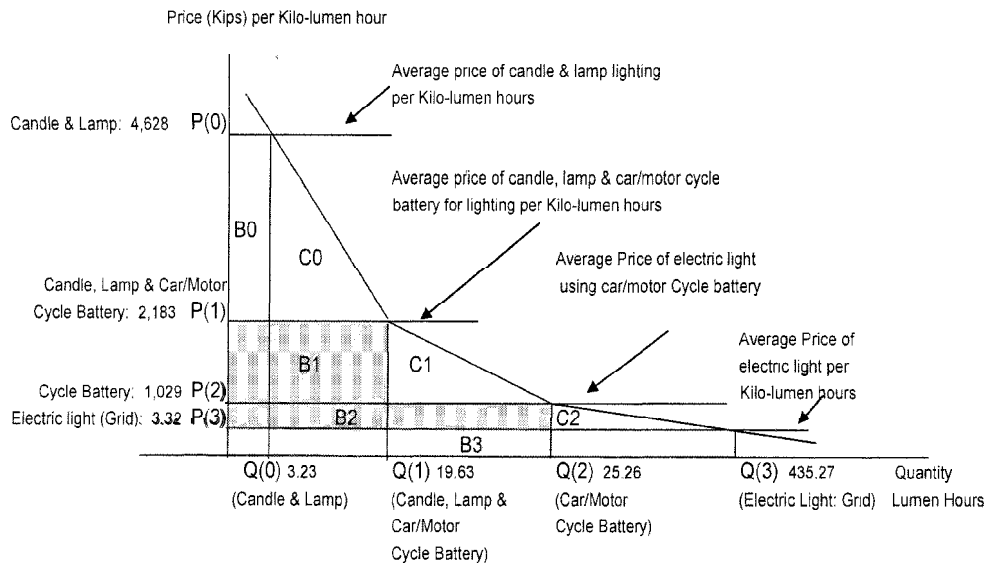


- Candle and lamp users and candle, lamp, and battery users move one step to SHSs.
- (f) The slope for the demand curve for each step to modern fuels is assumed to be 0.5.

**Grid Connection
Consumer Surplus and Willingness to Pay
For Lighting**

	Households Without Access to Grid Electricity			Grid Electricity
	Candle & Lamp Users	Candle, Lamp & Car/Motor Cycle Battery Users	Car/Motor Cycle Battery Users	Electric Light
Total spending for lighting/month/household (Kips)	12,883.89	24,228.63	16,869.70	1,531.91
Total spending for lighting/month/household (US\$)	\$ 1.52	\$ 2.85	\$ 1.98	\$ 0.18
Quantity of lighting obtained -- k-lumen hours/mo	3.23	19.63	25.26	435.27
Average price per k-Lumen hours (Kips)	4,627.91	2,183.41	1,028.92	3.32
Average price per k-Lumen hours (US\$)	\$ 0.54	\$ 0.26	\$ 0.12	\$ 0.00
Average price per k-Lumen hours	P(0)	P(1)	P(2)	P(3)
	4,627.91	2,183.41	1,028.92	3.32
Quantity of lighting obtained -- k-lumen hours/mo	Q(0)	Q(1)	Q(2)	Q(3)
	3.23	19.63	25.26	435.27
Adjust for Shape of Demand Curve (0.5=straight line)	0.50	0.50	0.50	
Consumer Surplus Gain (per mo)				
Consumer Move to Electricity Directly "One Step"	1,013,952.52	495,866.77	236,162.34	
	\$ 115.29	\$ 56.34	\$ 27.83	
Consumer move 3 steps to Electricity <i>(Broken Demand Curve)</i>	27,940.84	32,977.22	27,977.22	Sum of 3 Steps
	\$ 3.29	\$ 3.05	\$ 27.78	290,015.48
				34.12
Gross Benefit per Month				
Consumer Expenditure for Electric Lighting	1,531.91			
	\$ 0.18			
Consumer move 3 Steps to Electricity	291,547.39	\$ 34.30		
Gross Benefit per Year				
Consumer move 3 Steps to Electricity	3,498,568.68	\$ 411.60		

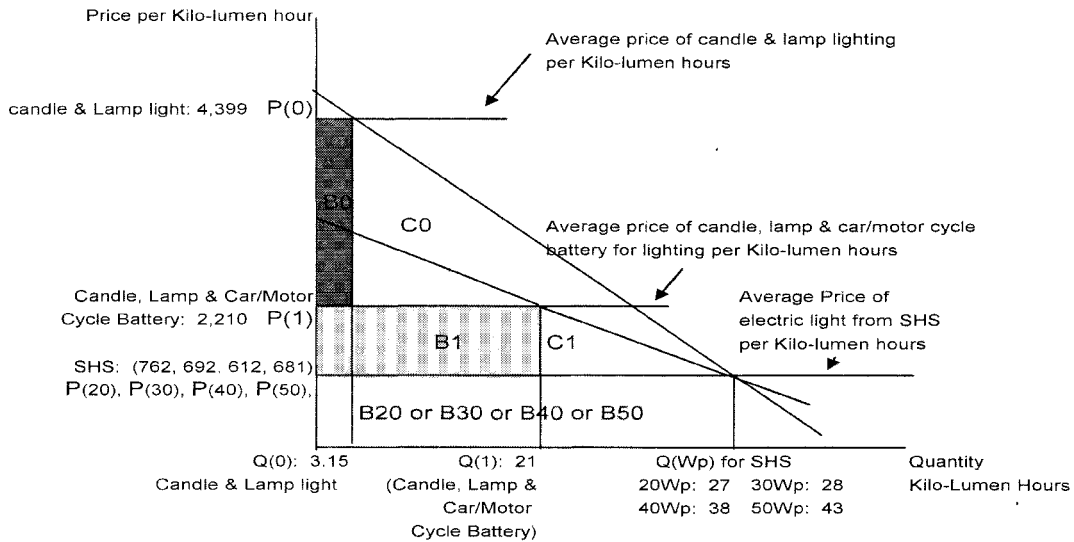
Figure 9-1: Household Benefits Estimation—Grid Connection



**Solar PV Home System (SHS)
Consumer Surplus and Willingness to Pay**

	Unelectrified Household		Solar PV Home System			
	Candle & Lamp Users	Candle, Lamp & Car/Motor Cycle Battery Users	20 Wp	30 Wp	40Wp	50 Wp
Total spending for lighting/month/household (Kips)	12,301.62	25,380.60	19,472.07	20,184.09	21,228.44	27,838.36
Total spending for lighting/month/household (US\$)	\$ 1.45	\$ 2.99	\$ 2.29	\$ 2.37	\$ 2.50	\$ 3.28
Quantity of lighting obtained -- k-lumen hours/mo	3.15	20.73	26.82	28.21	37.68	42.96
Average price per k-Lumen hours (Kips)	4,399.34	2,210.52	765.81	697.04	665.87	703.14
Average price per k-Lumen hours (US\$)	\$ 0.52	\$ 0.26	\$ 0.09	\$ 0.08	\$ 0.08	\$ 0.083
Average price per k-Lumen hours	P(0)	P(1)	P(20)	P(30)	P(40)	P(50)
Quantity of lighting obtained -- k-lumen hours/mo	4,399.34	2,210.52	761.75	691.83	611.58	681.24
	Q(0)	Q(1)	Q(20)	Q(30)	Q(40)	Q(50)
	3.15	20.73	26.82	28.03	37.68	42.96

Figure 9-2: Household Benefits Estimation—Solar Home Systems



Data Source: Household Survey 2004, Ministry of Industry and Handicraft.

**Consumer Surplus Gain (per mo)
20 Wp System**

	Candle & Lamp Users	Candle, Lamp & Car/Motor Cycle Battery Users		
Candle & Lamp, or Candle, Lamp, & Battery User: Move to 20 Wp SHS "One Step to 20 Wp SHS"	54,502.94	34,442.01		
	\$ 6.41	\$ 4.05		
Adjust for Shape of Demand Curve (0.5=straight line)	0.50	0.50		
	Gross Benefit per Month		Gross Benefit per Year	
Expenditure per Month for Lighting Using 20 Wp System	19,472.07	\$ 2.29		
Candle & Lamp User Move to 20 Wp SHS	73,975.01	\$ 8.70	887,700.17	\$ 104.44
Candle, Lamp, Battery User Move to 20 Wp SHS	53,914.08	\$ 6.34	646,968.95	\$ 76.11
Average Gross Benefits (All Assumptions)	63,944.55	\$ 7.52	767,334.56	\$ 90.27

**Consumer Surplus Gain (per mo)
30 Wp System**

	Candle & Lamp Users	Candle, Lamp & Car/Motor Cycle Battery Users		
Candle & Lamp, or Candle, Lamp, & Battery User: Move to 30 Wp SHS "One Step to 30 Wp SHS"	57,800.12	37,025.73		
	\$ 6.80	\$ 4.36		
Adjust for Shape of Demand Curve (0.5=straight line)	0.50	0.50		
	Gross Benefit per Month		Gross Benefit per Year	
Expenditure per Month for Lighting Using 30 Wp System	20,184.09	\$ 2.37		
Candle & Lamp User Move to 30 Wp SHS	77,984.21	\$ 9.17	935,810.56	\$ 110.10
Candle, Lamp, Battery User Move to 30 Wp SHS	57,209.82	\$ 6.73	686,517.82	\$ 80.77
Average Gross Benefits (All Assumptions)	67,597.02	\$ 7.95	811,164.19	\$ 95.43

**Consumer Surplus Gain (per mo)
40 Wp System**

	Candle & Lamp Users	Candle, Lamp & Car/Motor Cycle Battery Users		
Candle & Lamp, or Candle, Lamp, & Battery User: Move to 40 Wp SHS "One Step to 40 Wp SHS"	77,327.09	46,697.00		
	\$ 9.10	\$ 5.49		
Adjust for Shape of Demand Curve (0.5=straight line)	0.50	0.50		
	Gross Benefit per Month		Gross Benefit per Year	
Expenditure per Month for Lighting Using 40 Wp System	21,228.44	\$ 2.50		
Candle & Lamp User Move to 40 Wp SHS	98,555.53	\$ 11.59	\$1,182,666.36	\$ 139.14
Candle, Lamp, Battery User Move to 40 Wp SHS	67,925.44	\$ 7.99	\$ 815,105.27	\$ 95.89
Average Gross Benefits (All Assumptions)	83,240.48	\$ 9.79	998,885.81	\$ 117.52

**Consumer Surplus Gain (per mo)
50 Wp System**

	Candle & Lamp Users	Candle, Lamp & Car/Motor Cycle Battery Users		
Candle & Lamp, or Candle, Lamp, & Battery User: Move to 50 Wp SHS "One Step to 50 Wp SHS"	85,720.83	48,699.97		
	\$ 10.08	\$ 5.73		
Adjust for Shape of Demand Curve (0.5=straight line)	0.50	0.50		
	Gross Benefit per Month		Gross Benefit per Year	
Expenditure per Month for Lighting Using 50 Wp System	27,838.36	\$ 3.28		
Candle & Lamp User Move to 50 Wp SHS	113,559.19	\$ 13.36	1,362,710.28	\$ 160.32
Candle, Lamp, Battery User Move to 50 Wp SHS	76,538.33	\$ 9.00	918,459.95	\$ 108.05
Average Gross Benefits (All Assumptions)	95,048.76	\$ 11.18	1,140,585.12	\$ 134.19

E. Financial Analysis

10. **Key Financial Issues.** EdL is expected to be commercially viable, autonomous, and self financing. In accordance with its commitments under the Contract Plan signed with the Government, the Government undertook a set of measures to strengthen the financial position and long-term viability of EdL. These measures include, among others, periodic review of the tariff structure to maintain electricity tariffs at levels that will enable EdL to meet its financial and social objectives, keep pace with fluctuations in foreign exchange, maintain a sustainable level of tariffs aligned to actual costs, and comply with loan covenants of major creditors. The periodic tariff review, as embodied in the Power Sector Reform Policy Statement,⁹ is one of the significant measures recognized by the Government to strengthen the commercial functions of EdL. The policy also acknowledges the social dimension of electricity pricing and adopts specific guidelines and tariff-setting principles aimed at full cost recovery over a period of time. The tariff adjustments, which were initiated in May 2002 under the FRP aimed at these objectives with monthly increase of 2.3 percent, were suspended in June 2004, one year ahead of completion.

11. In recognition of the unresolved tariff issue, a Tariff Study was undertaken in preparation of REP I containing: (i) a detailed analysis of the actual cost of electricity supply to different classes of consumers at different points in the system; (ii) formulation of an appropriate subsidy policy and tariff structure reflecting the cost of supply; (iii) adjustment to new electricity tariff rates to reduce cross-subsidies and a suitable implementation plan; and (iv) identification and differentiation of subsidy flows (i.e. subsidies provided to EdL in various forms and the subsidies passed on to the different classes of consumers). As a result of the analysis, the Government endorsed on 24 June, 2005, a Tariff Adjustment to be rolled out from 2005 to 2011, and approved in November 2005 the Sustainability Action Plan including provisions for tariff adjustment against domestic inflation and fluctuations of exchange rate. At the end of the tariff adjustment period, EdL is projected to become commercially viable while maintaining a certain level of cross-subsidies and with a clear distinction between EdL's commercial operations and social obligations.

12. **Government's Overdue Receivables.** During preparation of REP I, agreement has been reached between EdL and GoL to off-set existing cross debts and to settle any balance remaining against EdL's debt obligations to government in FY06. Likewise, a mechanism for timely payment of future government bills has also been endorsed. Under the mechanism adequacy of government agencies' budget allocation for electricity will be reviewed and the budget allocations ear-marked for electricity bill payments. The off-set will be effectuated in case of non-payment up to two months by government agencies.

13. However, EdL continues to struggle with the accounts receivables from government agencies. The GoL has agreed with EdL on the amount of Government arrears up to 2006 and a settlement plan for off-setting the arrears over a 4-year period has been agreed and its implementation has been on track. The major reasons of slow settlement of arrears from government agencies are: (i) slow verification of the quantum of Government Arrears of 2007-2008; and (ii) new arrears occurred during 2006-2009 due to insufficient budget allocations to pay the electricity bills in full—allocations are about 50% of consumptions. While the Government has committed to make sufficient budget allocations to the Government agencies for electricity consumptions in 2010, review and verification of the arrears in 2007-2009 is underway and the Government has committed to settle all arrears by 2012 once the arrears are verified by EdL and the Government.

⁹ Issued by the Government in March 2001. It sets out the main elements of the power sector policy and establishes priorities and objectives of the GoL for the development of the power sector.

14. ***PDP and Financing.*** Financing EdL's system expansion has traditionally been provided by multilateral and bilateral agencies through soft loans and grants. With annual growth rates now coming off a higher base, capital requirements are increasing at a time when the power sector's traditional lenders are re-focusing their programs on other sectors. Non-traditional lenders, China and India, are playing an increasing role through provision of export credits (with significant grant element) for projects where goods and construction services are sourced through their respective countries. Lao's earlier successes with export generation projects demonstrates that the international private sector (particularly the Thai private sector) can play a role and the nascent local private sector and domestic banks should not be ruled out as a source of capital for smaller projects.

15. A Power Sector Financing Strategy Study and associated workshops recommended that GoL: (i) examine financing modalities (traditional, built-operate-transfer, public-private and leveraging of bilateral and multilateral funds through credit enhancement or direct lending); (ii) develop solicitation strategies for supplier financed public projects and privately developed projects; and (iii) prepare projects (particularly hydropower projects) for solicitation to improve risk profile. During the Phase I of REP and as a trigger for Phase II, government will review the recommendations of the study and translate them into a Power Sector Financing Strategy endorsed by the Government. The strategy directions will also be reflected and discussed in EdL's annual Power System Development Plan, the current version of which indicates a gradual increase in reliance on IPP off-take in combination with own investments in generation assets where sanctioned due to system optimization.

16. ***EdL Non-Operating Income.*** The government is the owner of EdL, the nominee shareholder for most of its IPP investment projects. EdL currently holds, for GoL, shares of 60 percent and 20 percent in Theun-Hinboun Power Company and Houay Ho Power Company, respectively. As such, it is entitled to a share of the total dividends declared proportional to its shareholding. The dividends from these investments represent significant amounts of EdL's non-operating income and their treatment presents major issues. However, the dividends also create distortion effects on EdL's balance sheet and income statement. The Government is also concerned that the efficient and effective allocation and treatment of these dividends should be in the context of the overall country revenue management policy and not in the narrower context of the corporate finances of EdL. In the case of Nam Theun 2 project, the Lao State Holding Enterprise has been established as a special holding company to own Government's shares in the Nam Theun 2 Power Company Ltd., the company that will manage and operate the Nam Theun 2 project for the 25-year concession period. It has been recommended that this or a similar structure (i.e., an asset management company, like State Holding Enterprise, to invest and raise financing for the power sector) be applied to all other future generation investments of the government in the power sector. ADB is presently conducting a study for IPP development and institutional restructuring to, among other tasks, identify and structure an appropriate government agency to own and manage GoL's future IPP equity investments. This is in line with the principles of the tariff adjustment proposed in the Sustainability Action Plan which assumes that tariff adjustment will enable EdL to become financially self-sustaining (taking into account its social obligations) by 2011 and phase out gradually reliance on IPP dividends for debt services.

E.1. Financial Prospects of EdL

17. ***Assumptions.*** A base case scenario for the period of FY09-19 was developed for EdL's financial projections with the following major assumptions: (i) annual average load growth of 11 percent; (ii) local and foreign inflation at 4 percent and 2 percent, respectively; (iii) capital investment program based on past capital expenditures and assessment of implementation capacity of future capital expenditure; (iv) tariff regime in accordance with the tariff adjustment effective July 2005; and (v) export import tariff are as specified in EGAT and Electricity of Vietnam contracts with EdL. Other assumption parameters include: (i) no cash nor equity injections from the government; (ii) financing

plan for new investments consisting of 60-70 percent borrowings and 30-40 percent self generation; (iii) interest support for existing social and non-social loans under the previous Financial Recovery Plan will cease, as scheduled; (iv) future loans at commercial rates (5-7.5 percent); (v) dividend income from IPPs is based on 15% ROE and 50% dividend payout ratio and (vi) receivables at two months of sales. For details, see Table 9-5.

Table 9-5: Key Assumptions for the Forecast Period

Fiscal Year ending December 31	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Operational Data											
EDL's own Generation (GWh)	1,777	1,549	1,849	1,886	1,886	2,701	2,923	3,002	3,002	3,002	3,002
Purchases from IPPs (GWh)	593	1,256	1,557	1,557	1,557	1,557	1,557	1,557	1,557	1,557	1,557
Imported Electricity (GWh)	202	211	173	191	302	237	270	530	986	1,498	2,065
Total Supply (GWh)	2,572	3,016	3,579	3,634	3,745	4,495	4,749	5,089	5,545	6,057	6,624
System losses (GWh)	350	357	368	372	405	455	499	548	602	661	726
Electricity Sold											
Domestic (Kip/kWh)	1,865	2,070	2,298	2,551	2,831	3,143	3,489	3,872	4,298	4,771	5,296
Export (GWh)	357	589	913	712	509	897	762	669	645	625	603
Total Energy Sold (GWh)	2,222	2,659	3,211	3,263	3,340	4,040	4,250	4,541	4,943	5,396	5,899
Average Yield											
Domestic (Kip/kWh)	593	623	654	687	722	759	792	828	865	904	945
Export (Kip/kWh)	352	377	406	439	477	518	560	606	656	710	769
Purchase Cost											
IPP Tariff (Kip/kWh)	265	277	291	307	326	347	369	393	418	445	474
Import Tariff (Kip/kWh)	441	472	507	548	596	647	700	758	820	888	961
Economic Data											
GDP growth rate constant prices (real)	0%	0%	6%	6%	6%	6%	7%	5%	6%	6%	4%
Kip per \$ average for year	8487	8694	8962	9278	9656	10049	10489	10948	11427	11927	12449
Local Inflation (Year to 31 December)	4%	5%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Annual Capital Expenditures (US\$ M)	79	69	59	59	59	59	59	59	59	59	59
Financing Plan											
Foreign Currency Loans (US\$ M)	64	43	42	36	38	39	41	43	45	47	49
Local Currency Loans (US\$ M)	-	-	-	-	-	-	-	-	-	-	-
Grants (US\$ M)	13	7	-	-	-	-	-	-	-	-	-
EDL Retained Earnings (US\$ M)	2	19	17	22	21	19	18	16	14	12	10
Total Funding (US\$ M)	79	69	59	59	59	59	59	59	59	59	59
Investment in IPPs (US\$ M)	10	8	5	5	5	-	-	-	-	-	-
Dividends in IPPs (US\$ M)	15	10	10	14	20	21	21	21	21	21	21

18. **Financial Forecast and Future Covenant Compliance.** On the basis of these forecasts, EdL concluded that future performance would be greatly impacted by the level of capital expenditures during FY09-19. The Government and EdL would agree on the critical capital expenditures, particularly for Xeset and related transmission network and propose investment options taking into account optimal allocation of public resources in the long term, the projects that should and could be developed by the private sector, the available financing from external sources, and the direct support that could be provided by the Government in order to achieve the required financial ratios.

19. Table 9-6 provides a summary of EdL's projected financial ratios and covenant compliance for FY09-19:

Table 9-6: Projection of EdL's Key Financial Performance Indicators

Financial Ratios	Required	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Debt Service Coverage Ratio (times)	>1.3	2.32	1.55	1.83	1.70	1.82	2.50	2.53	2.38	2.10	1.82	1.58
Self-financing Ratio (%)	>15	28	25	26	35	36	40	40	40	40	40	40
Long-term Debt to Equity Ratio (times)	<1.5	0.88	0.87	0.87	0.83	0.77	0.70	0.62	0.56	0.50	0.46	0.43

20. EdL assumes that with the completion of Xeset and Xepon and no other generation projects earmarked until FY11, its cash position would be at more manageable levels. However, due to increase in electricity purchase costs from new supply coming from existing PPAs with EdL invested IPPs, the debt service coverage ratio would show some strain in FY10. Government has agreed that all necessary measures will be taken including but not limited to raising electricity tariffs, to ensure that EdL meet the financial covenants as follows: (i) maintaining a self-financing ratio of no less than 15 percent of the annual average of its capital expenditures incurred or expect to be incurred for that fiscal year, the previous fiscal year and the following fiscal year; (ii) maintaining net revenues of no less than 1.3 times annual projected debt service payments; and (iii) maintaining the ratio of its long-term debt to no more than 1.5 times its equity.

21. *EdL's financial performance and projections.* See Table 9-7.

Table 9-7: EdL Financial Operating Results and Projection (FY09-19)

Fiscal Year ending December 31 (Billion Kip)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Income Statement Items:											
Revenues	1,277	1,558	1,921	2,113	2,337	2,901	3,246	3,670	4,206	4,828	5,548
EBITDA	720	664	817	939	1,111	1,521	1,695	1,744	1,676	1,551	1,355
Net Income/Loss	232	142	216	267	365	617	707	723	666	575	439
Cash Flow Items:											
Cash Flow from Operating Activities	592	577	727	806	917	1,310	1,475	1,515	1,436	1,300	1,094
Cash Flow from Financing Activities	265	68	(73)	(225)	(270)	(255)	(300)	(348)	(395)	(430)	(418)
Cash Flow from Investing Activities	(626)	(577)	(485)	(455)	(418)	(381)	(397)	(415)	(433)	(452)	(471)
Change in Working Capital	(46)	(53)	(55)	(36)	(59)	(79)	(64)	(90)	(122)	(146)	(173)
Taxes Paid	(75)	(43)	(81)	(92)	(121)	(250)	(295)	(300)	(266)	(212)	(135)
Balance Sheet Items:											
Fixed Assets	7,805	8,216	8,525	8,834	9,153	9,438	9,735	10,043	10,364	10,697	11,044
Current Assets	834	908	1,032	1,084	1,211	1,665	2,177	2,694	3,139	3,471	3,695
Total Assets	8,639	9,125	9,557	9,918	10,365	11,103	11,912	12,737	13,503	14,169	14,739
Equity	5,367	5,620	5,836	6,103	6,468	7,085	7,792	8,515	9,182	9,756	10,195
Long-Term Liabilities	2,787	2,955	3,057	3,086	3,163	3,205	3,223	3,201	3,149	3,109	3,701
Current Liabilities	485	550	664	729	734	813	897	1,020	1,172	1,303	843
Total Equity and Liabilities	8,639	9,125	9,557	9,918	10,365	11,103	11,912	12,737	13,503	14,169	14,739
Financial Ratios:											
Operating Margin (%)	51%	40%	41%	42%	44%	49%	49%	45%	38%	31%	23%
Net Margin (%)	18%	9%	11%	13%	16%	21%	22%	20%	16%	12%	8%
Debt Service Coverage Ratio (times)	2.32	1.55	1.83	1.70	1.82	2.50	2.53	2.38	2.10	1.82	1.58
Self-Financing Ratio (%)	28%	25%	26%	35%	36%	40%	40%	40%	40%	40%	40%
Return on Capital Employed	8%	6%	8%	9%	11%	15%	16%	15%	13%	11%	8%
LT Debt to Equity Ratio (times)	0.88	0.87	0.87	0.83	0.77	0.70	0.62	0.56	0.50	0.46	0.43
Current Ratio (times)	1.72	1.65	1.55	1.49	1.65	2.05	2.43	2.64	2.68	2.66	4.39

Annex 10: Safeguard Policy Issues

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in Support of the Rural Electrification (APL) Program

A. Introduction

1. This project is the second phase of the Rural Electrification APL Program approved under a six-year IDA APL aiming to (a) increase access to electricity of rural households in villages of project provinces¹⁰ and (b) achieve sustainability of power sector development. The activities will be implemented through two components: the EdL component and the MEM component through its DOE. The REP I target for physical investment of the EdL component is set at about 42,000 households in some 540 villages in the seven central and southern provinces, while the REP II target is about 27,700 rural households. The physical investment of the MEM component will electrify about 10,000 households across the 17 provinces through off-grid technologies, including SHSs, pico-hydro, or other alternative technologies (such as village hydro, household biogas digesters, and village biomass). The implementation period would be during 2006–10 for REP I and 2010–13 for REP II. Given the need to go through extensive consultation with local authorities and communities during the confirmation of the subprojects, implementation of REP I has been delayed somewhat. Because of price escalation during 2006–07, about 70 percent of the targets of REP I have been achieved as of June 2009. It is anticipated that financing resource under REP I can only finance about 33,820 households or 80 percent of the original target. The REP I implementation is ongoing with an extension of closing date and additional financing from AusAID.

2. This annex highlights the REP II project description, identifies potential safeguard issues in light of the lessons learned from REP I, and highlights safeguard activities to be carried out under REP II.

B. Project Description

3. The development objectives and the implementation arrangement for REP II remain the same as those for REP I with targets for the physical investment as follows: (a) grid extension to about 27,700 households in the project provinces and (b) electrification by SHSs and pico-hydro and other alternative energy technologies to about 10,000 households nationwide. The project will also provide technical assistance to promote the use of other renewable energy technology through private participation. Descriptions of the physical investment are summarized below.

4. **Grid Extension.** Activities will involve erection of 8–14 m concrete poles for the LV to MV line (0.4–22 kV), of which about one sixth will be buried underground. Poles will generally be spaced at a frequency of about 40 poles/km along existing roads and within the existing right of ways. Step-down voltage transformers will be supported on the same poles. A small amount of land may be required for some poles and small substations. Under REP II, the network extension will comprise about 1,197 km of 12.7–22 kV and 611 km of 0.4 kV transmission or distribution lines, 358 sets of transformers of various types and capacities, and house wiring in about 27,700 households, and about 50 subprojects are expected.

¹⁰ The project provinces are 7 southern provinces, namely: Bolikhamxay, Khammouane, Savannakhet, Saravan, Xekong, Champasak, and Attapeu for grid extension (Component A), and 17 provinces for off-grid electrification (Component B).

5. **Solar Home Systems.** Photovoltaic cells transform solar energy into electrical energy without intermediate mechanical devices. Key investment includes a solar panel (20–50 Wp) on a pole, controller, battery, and indoor wiring.

6. **Pico-hydro.** This is small hydropower with installing capacity of less than 5 kW. Pico-hydro is suitable for mountainous areas with falling water. It is a lowest-cost, off-grid technology for generating electricity. Lighting from pico-hydro is both cheaper and environmental friendlier than using kerosene lamps. This investment comprises a self-contained turbine-generator unit (0.2–2 kW), LV wiring, and a voltage controller that can provide electricity to one or several households. Given limited financing resources, implementation of pico-hydro and other technologies are expected to be implemented through private participation separately from REP II.

C. **Safeguard Issues, Activities, and Lessons Learned from REP I**

7. **Safeguard Activities under REP I.** Under REP I, installation of about 1,400 km of 12.7–22 kV and 1,000 km of 0.4 kV for 42,000 households and 627 transformers were planned to be carried out through 67 subprojects. Adverse environmental and social impacts were not anticipated, and the safeguard category “B” was assigned. For the EdL component, the Environmental Management Plans for the first-year subprojects (45 subprojects in 545 villages) were prepared and submitted to the Bank. An Environmental Policy Framework, an Ethnic People’s Development Plan, and a Compensation Standards were prepared and expected to be applied to the remaining subprojects. For the MEM component, about 9,000 households have been installed with SHSs. The feasibility studies of 14 new pico-hydro and 2 existing pico-hydro (each with 5–10 kW capacity and serving about 1,181 households) were completed. During the feasibility study, safety of pico-hydro operation was observed, and safety awareness and training was incorporated in the preparation process. For the biomass system, site identification has been completed and a feasibility study is ongoing. A budget of US\$0.14 million was allocated for safeguard capacity building, and EdL is the lead agency responsible for the implementation. Key activities carried out included (a) procurement of necessary equipment, (b) an assessment of safeguard capacity building needs of the Environment Office by Earth System Lao; and (c) a series of EdL/DOE safeguard training. A Terms of Reference for hiring of consultant to develop training courses and materials for EdL managers and technical, an in-country study visit, and a study visit to Thailand are being finalized for implementation in late 2009. The Bank also provided additional technical assistance to assist EdL and the DOE in the drafting of a Safeguard Operation Manual for grid extension and off-grid investment subcomponents.

8. **Lessons Learned from REP I.** Review of supervision records and reports, and discussion with the agencies during supervision of REP I and preparation of REP II suggested the following:

(a) *Under the EdL Component:* The first group of subprojects were carried out in 2007–08; the subprojects were selected through consultation with local authorities and communities, and many have resulted in shifting of the alignments; the local community are actively participate in the planning, construction, and operation, and many are willing to voluntarily contribute land and rights over trees and assets; most of the subprojects are located along the existing roads, and the actual impacts on local environment and the need for a new right of ways clearance are minimal (maximum requirement for the right of way of 22 kV is 8 meters); and monitoring and report system on safeguard performance is lacking because of the limited knowledge and capacity of EdL staff at the provincial level. For forging effective execution of safeguard measures on the ground, key lessons learned are highlighted below:

- *Need for a flexible safeguard requirement.* Identification and decision on the subprojects requires extensive discussion with local authorities and community and the process could change the direction and size of the subprojects. Preparation of an Environmental

Management Plan and obtaining Bank clearance for the subproject therefore have not been necessary or effective. Given that most of the subprojects will be located along existing roads, EdL proposed to apply a check list approach and developed a draft form and specific requirements for good engineering practices and good housekeeping as a mean to mitigate the potential negative environmental impacts. These requirements will be included as part of the Safeguard Operation Manual.

- *Need for safeguard training of EdL staff in the field.* In addition to the equipment and clear operational process, knowledge and understanding of safeguard issues and requirements by field staff will be critical. Limited awareness and knowledge of safeguard measures by field staff make it difficult for the Environmental Office to ensure effective implementation of safeguard measures. There are five EdL branch offices in the project provinces. Many EdL staff do not have strong English language skills, and this has contributed to their difficulty in understanding the safeguard requirements and the Bank's comments.
 - *Compensation to local community.* In REP I, it became the practice to provide community-based compensation for land required for placement of electricity distribution poles. This was necessary because of high transaction costs involved because of the large number of poles, and because the compensation amounts to be paid for the tiny fraction of a square meter required for each pole would be exceedingly small. With the agreement of local residents, EdL instead provides free installation of electrical hookups to one or more community facilities (for example, village wat (temple) or school) as a compensation measure. This practice will continue in REP II. EdL is required to provide clear documentation regarding amounts of land acquired and compensatory measures provided in each affected village in the project progress report.
 - *Need for active involvement of senior staff and streamlining of internal operation procedure.* Specific review of EdL's performance indicated that the Environment Office has been established under the planning division and still has inadequate staff and budget to function effectively. Under REP I, the Environmental Office, with assistance from the EdL branch office staff, is responsible for social screening and assessment of social impacts, including determining the compensation amount and providing safeguard training. The Environmental Office does not have any authority to supervise or monitor safeguard performance of EdL staff in other divisions and/or at the branch offices. A long-term training of EdL staff will also be necessary. EdL is hiring a qualified consultant to develop the training courses and materials for EdL management and technical staff, including undertaking two study visits (one to Nam Theun 2 and one to EGAT). A Terms of Reference has been finalized, and the activities are expected to be carried out in late 2009.
- (b) *Under the MEM Component:* Execution of the off-grid electrification is limited to the SHSs, and the subprojects do not create any negative impacts. Experience from the pilot study of pico-hydro suggested that the safety of local people during operation can be an issue, but this can be mitigated through communication and increased awareness on the part of the local population. However, DOE/MEM understanding and capacity to ensure effective implementation of safeguard measures, especially consultation with ethnic minority groups, need to be built.

D. Safeguard Issues and Actions under REP II

9. **Safeguard Issues and Application of ESSF.** Given that the off-grid subproject will be implemented nationwide, while the grid extension subcomponent will be implemented in the seven central-southern provinces, the project may involve ethnic minority and/or minor land acquisition or restrictions (temporary or permanent) on land use. The Ethnic People's Development Plan and the Compensation Standards, which were prepared for REP I, were reviewed and discussed with the implementing agencies (EdL and DOE/MEM) in light of the implementation experience mentioned

above. The revised Resettlement Policy Framework and the Ethnic Group Development Framework and details are highlighted in Section G below.

10. On the environmental issues, similar to REP I, adverse negative impacts are not anticipated. Experience during the planning and implementation of REP I suggested that providing LV transmission line to local communities (grid extension) will involve small-scale civil works, and the negative impacts (dust, noise, wastes, site clearance) on local environment during construction will be temporary and localized, and can be mitigated by good engineering practices. Most of the REP I subprojects follow existing roads, although many of the final subproject routes were changed after extensive consultation with the local community and local authority. EdL proposes to apply good engineering practices and an effective safeguard screening process and to continue training of EdL staff, especially those in the branch offices. Although the negative impacts of the off-grid subproject are not expected, an ESSF for the off-grid subprojects is prepared if other alternative technology (such as pico-hydro, household biogas, village hydro, and village biomass) is conducted. The two ESSFs, which include a Resettlement Policy Framework and Ethnic Group Development Framework, are prepared to ensure that adverse impacts will not occur, or can be adequately mitigated. Details on the ESSF are provided in Sections E, F, and G below. Given the small nature of earth excavations and the application of the participatory planning approach, negative impacts on cultural property are not anticipated, and the Physical Cultural Resources policy (OP/BP 4.11) is not triggered. However, a “chance find” procedure will be included in the contractor’s contract to ensure that proper actions will be carried out if any significant artifacts are found.

11. **Review and Application of the ESSF.** In light of the scope of REP II, the REP I safeguard implementation experience (Section C above) and the two ESSFs (one for the grid-extension and one for the off-grid subprojects) were reviewed and found to be relevant and applicable. The ESSFs highlights the commitment of the implementing agencies, including assigning clear responsibility to offices or units; summarizes the self-assessment of the issues and lessons learned during REP I; and defines the screening criteria and steps to be undertaken during implementation of REP II project. Key elements of the ESSF for the grid-extension and off-grid projects are summarized in Sections E and F below, while those of the Ethnic Group Development Framework and Ethnic Group Development Framework are summarized in Section G.

12. The ESSFs will be applied to all the grid-extension subprojects and the off-grid subprojects that involve pico-hydro or other technologies (such as village hydro or biomass), land acquisition, restriction of land use, and/or ethnic minority groups. The SHS subprojects will not be required to apply the screening process, provided that the subproject identification and preparation will be made through the consultation process, especially with ethnic groups, and that used battery will be incorporated as part of the management and/or consultant contract (Village Off-grid Promotion Office and provincial ESCOs).

13. **Application of Safeguard Operation Manual and Training of Field Staff.** Although most of the potential impacts during construction and operations are localized, temporary, and can be mitigated through the application of good engineering practices and good housekeeping, these measures will have to be implemented by EdL field staff. Training and capacity building of the seven EdL field offices will be carried out by the Environmental Office. The Safeguard Operation Manual will describe the safeguard procedure and process, including roles and responsibility of the offices or units, as well as technical guidance, including standard screening and monitoring forms for social and environmental activities. The Environmental Office will also provide safeguard training to the concerned staff. Periodic Bank supervision will ensure that this has been carried out effectively. A budget of US\$0.25M has been allocated for this subcomponent. Additional training and technical assistance, especially for the DOE, will be undertaken under a separate technical assistance project for hydropower and mining, which is expected to be implemented in parallel.

E. ESSF for the Grid Extension Subprojects

14. **Agency Commitment and Assignment of Responsibility.** The following commitment is described in the ESSF for grid extension subprojects:

- All EdL staff is responsibility for ensuring full compliance with the government's laws and regulations related to environmental and social safeguard.
- All units and offices, especially those involved in the planning, design, construction, and maintenance, are responsible for ensuring that the environment and social requirements are (a) incorporated into the project planning, detailed design, and contract documents; and (b) in compliance with the ESSF during construction and maintenance.
- The Environmental Office is responsible for developing appropriate policy direction, operational guidelines and procedures, and technical guidelines related to environmental and social safeguards, and for providing appropriate training and capacity building to other units and offices, as needed.
- The branch office is responsible for undertaking safeguard activities, as agreed with the Environmental Office of EdL, including ensuring effective communication with the local authority and local community throughout the project development cycle.
- When possible, efforts will be made to increase knowledge and awareness of the local authority and people on the importance of environmental protection and the government and/or World Bank safeguard requirements.
- EdL will ensure that all staff has an opportunity to increase their knowledge and understanding of environment and social safeguards related to hydropower development and grid extension by incorporating the safeguard training courses into the overall training program being carried out at the EdL training center. When possible, study visits to neighboring countries will be carried out to expand the knowledge and experience of EdL managers and key staff on the institutional arrangement and capacity building and on appropriate technology that could enhance EdL performance in line with the National Policy on Environmental and Social Sustainability of the Hydropower Sector in Lao PDR (2005); EdL will work closely with the DOE/MEM and other agencies (both at national and local level) responsible for development and implementation of the government's regulations related to social and environment safeguards, especially those related to ethnic peoples, such as the Lao Women's Union and the Lao Front.

15. **Application of the ESSF:** This policy framework will be applied to all the civil works subprojects to be implemented under REP II:

- The safeguard implementation procedure will be guided by the Safeguard Operation Manual, which will be finalized by the Environmental Office by the end of 2009. The manual will describe the safeguard procedure and process, including the roles and responsibilities of the offices units, as well as technical guidance, including standard screening and monitoring forms for social and environmental activities. The Environmental Office will also provide safeguard training to the concerned staff.
- The concerned units are responsible for forging effective implementation of safeguard measures for all the subprojects, including timely submission of the safeguard screening and monitoring to the Environmental Office.

- The Environmental Office will be responsible for monitoring the compliance with the safeguard requirement for REP II, including ensuring that all EdL contractors and/or development partners undertaking the investment activities of the subprojects are aware of and commit to complying with the safeguard requirements and that their performance is acceptable. The results will be reported to EdL management and the World Bank periodically.
- If initial environmental examination or environmental impact assessment is required by the government and/or World Bank, the Environmental Office will take the lead in the preparation with assistance from other offices, units, or consultants, as needed.
- Associated requirement for environmental management under the ESSF will be included as an important part of the bidding documents for selection of contractors for installation works. EdL will ensure that EdL's contracts for installation of grid extension subprojects under REP II have adequate capacity to effectively implement the safeguards. The mitigation measures (for example, good practices and Environmental Management Plan) during the construction phase will form the basis of contractual obligations to be carried out by the construction team or contractor.
- If the subproject is located in an area known to have unexploded ordnance and possible cultural heritage sites, The Environmental Office will ensure proper inclusion of special measures designed to adequately address the issues and situation (for example, conduct rapid assessment and initial environmental examination or environmental impact assessment, including the "chance find" procedure and specific safeguard requirements in protected areas) and inform the Bank. If the subproject is subject to initial environmental examination or environmental impact assessment as required by the government's environmental regulation, the Environmental Office will ensure their compliance. If a new alignment, especially in the protected area or sensitive area, is required, the Environmental Office will conduct rapid assessment and inform the Bank before selecting the subproject.
- EdL will ensure that the contract for implementation of the subprojects will include safeguard requirements for REP II and identify key point of EdL intervention and also identify the training needs for discussion during the upcoming appraisal mission.

F. ESSF for the Off-Grid Subproject

16. Agency Commitment and Assignment of Responsibility.

- All DOE staff is responsible for ensuring full compliance with the government's laws and regulations related to environmental and social safeguard.
- All units or offices, especially those involved in the planning, design, construction, and maintenance, are responsible for ensuring that the environment and social requirements are: (a) incorporated into the project planning, detailed design, and contract documents; and (b) in compliance with the ESSF during construction and maintenance;
- The Social and Environmental Management Division of the DOE is responsible for developing an appropriate policy direction, operational guidelines and procedures, and technical guidelines related to environmental and social safeguards, and for providing appropriate training and capacity building to other units and offices, as needed.
- The Provincial Department of Energy and Mines is responsible for undertaking safeguard activities, as agreed with project management unit or Social and Environmental Management Division, including ensuring effective communication with local authority and local community throughout the project development cycle. When possible, efforts will be made to increase

knowledge and awareness of the local authority and people on the importance of environmental protection and the government and/or World Bank safeguard requirements.

- The DOE will ensure that all staff has an opportunity to increase their knowledge and understanding on environment and social safeguards related to solar system, hydropower development, and grid extension by incorporating the safeguard training courses into the overall training program being carried out at EdL training center and/or MEM's training center which is to be established. When possible, study visits to neighboring countries will be carried out to expand knowledge and experience of DOE managers and key staff on the institutional arrangement and capacity building and on appropriate technology that could enhance DOE performance in line with the National Policy on Environmental and Social Sustainability of the Hydropower Sector in Lao PDR (2005); and the DOE will work closely with EdL and other agencies (both at national and local level) responsible for development and implementation of the government's regulations related to social and environment safeguards, especially those (the Lao Women Union and the Lao Front) related to ethnic peoples.

17. Application of ESSF: This policy framework will be applied to all the civil works subprojects to be implemented under REP II:

- The safeguard implementation procedure will be guided by the Safeguard Operation Manual, which will be finalized by the Project Management Unit of DOE. The manual will describe the safeguard procedure and process, including roles and responsibility of the offices or units, as well as technical guidance, including standard screening and monitoring forms for social and environmental activities. The DOE or project management unit will also provide safeguard training to the concerned staff.
- The concerned units are responsible for forging effective implementation of safeguard measures for all the subprojects, including timely submission of the safeguard screening and monitoring to the DOE or project management unit.
- The DOE or project management unit will be responsible for monitoring the compliance with the safeguard requirement for DOE subprojects of REP II, including ensuring that all provincial ESCOs and DOE contractors and/or development partners undertaking the investment activities of the subprojects are aware of and commit to complying with the safeguard requirements and that their performance is acceptable. The results will be reported to DOE management and the World Bank periodically.
- If initial environmental examination or environmental impact assessment is required by the government and/or World Bank, the DOE or project management unit will take the lead in the preparation with assistance from the Social and Environmental Management Division and other offices or units and consultants, as needed.
- Implementation has been done through a contract between the DOE and the management contractor (village off-grid promotion office) who later subcontracts the provincial ESCO to conduct the survey, identify the beneficiaries, and provide after-sales services.
- The DOE or project management unit will develop a set of Good Management system for used batteries and will apply them as the mitigation measures for all the SHS subprojects.

G. Social Issues of REP II

18. While details on the Ethnic Group Development Framework and Ethnical Group Development Framework are provided in the ESSFs, key elements are summarized as follows:

- *Ethnic Group Development Framework:* In order to ensure that any adverse impacts are identified and mitigated in compliance with World Bank policy, the Resettlement Policy Framework specifies eligibility and entitlement principles and guidelines for preparation of the Resettlement Plan. The Ethnic Group Development Framework will be translated into Lao and distributed to the branch offices of EdL, Energy Construction and Installation Company, and provincial agencies responsible for the planning and implementation of works.
- *Implementation:* The identification and mitigation of any adverse impacts will be implemented and managed by EdL's branch office under close supervision of the Environmental Office of EdL.
- *Public Information and consultation:* EdL will ensure that all branch offices and Energy Construction and Installation Company are properly informed in a timely manner of the subproject activities to be carried out and that the provisions of the Ethnic Group Development Framework are effectively disclosed to the local population and are local authority. If necessary, a compensation plan for each subproject will be prepared and disclosed to the public. These plans also would be kept in the project files for World Bank review.
- *Complaints and Grievances:* Complaints and grievance procedures will be established at branch offices in the provinces and at the Environmental Office in Vientiane. In case complaint and grievances issues are appealed, they will be first dealt with by the branch office and the district administration. If the issues cannot be resolved, they will be dealt with by the Environmental Office and the provincial authorities. Project Displaced Persons will be exempted from all administrative and legal fees incurred in pursuant to the grievance redress procedures.
- *Voluntary Contributions:* Where local residents are willing to make a voluntary contribution of very small parcels of affected land without compensation, the Environmental Office will ensure that the impacts on the affected people are insignificant (for example, that they do not have any impact on structures, do not require physical relocation, and do not result in loss of economic viability of remaining holdings). The process of consultation with potential contributors will be conducted in an open and transparent manner by branch office and the district officials and decisions for "voluntary" contributions will be based on the "informed choice" of affected people. People who are willing to make voluntary contributions must be informed of their rights to compensation, and the process and decisions must be documented by the district authorities. In the instance of land required for placement of distribution poles (for the grid extension subcomponent), community-based compensation will be provided in the form of free installation of electrical hookups to one or more community facilities, such as a village wat or school. EdL will keep records of all land acquired, voluntary consent forms, or community compensatory measures for Bank review.
- *Ethnic Groups:* REP II is not expected to generate adverse impacts on minority ethnic groups living within the project area (which includes the same provinces involved in REP I). However, EdL has prepared an Ethnic Groups Development Framework in line with the Bank's policy, and it will be applied to REP II subprojects. The Ethnic Group Development Framework describes the screening requirements, the principles and procedures for "free, prior and informed" consultation as required under OP 4.10, and reporting and monitoring activities. If the subprojects are located in an area involving ethnic minority groups, consultation will follow the guidelines provided in the Ethnic Group Development Framework/ESSF. The ESSFs, including the Resettlement Policy Frameworks and Ethnic Group Development Frameworks, will be disclosed in Lao to the local authorities and communities affected by the project.

Annex 11: Project Preparation and Supervision

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in Support of the Rural Electrification (APL) Program

A. Preparation Timeline

<i>Milestone</i>	<i>Planned</i>	<i>Actual</i>
Project concept note review		04/27/2006
Updated Project Information Document to Infoshop	10/02/2009	12/14/2009
Updated Integrated Safeguards Data Sheet to Infoshop	10/02/2009	12/15/2009
Project appraisal	10/02/2009	10/07/2009
Negotiations	10/15/2009	11/23/2009
Scheduled board date	01/12/2010	
Planned date of effectiveness	02/28/2010	
Planned closing date	06/30/2014	

B. Preparation Process and Funding

Estimated Approval and Supervision costs

Remaining cost to Approval:	US\$35,000
Estimated annual supervision cost:	US\$65,000 (IDA)

C. Project Team

A team of IDA staff and consultants who worked on preparation of the project include the following:

Staff:

- Jie Tang, Task Team Leader, Senior Energy Specialist
- Sombath Southivong, Senior Infrastructure Specialist
- Kannathee Danaisawat, Financial Management Specialist
- Oithip Mongkolsawat, Senior Procurement Specialist
- Manida Unkulvasapaul, Senior Environmental Specialist
- Daniel Gibson, Senior Social Scientist
- Pajnapa Peamsilpakulchorn, Infrastructure Analyst
- Teresita Ortega, Program Assistant
- Vachraras Pasuksawan, Program Assistant
- Chutima Lowattanakarn, Team Assistant
- Litao Zhang, Operation Officer

Consultants:

- Grayson Heffner, Alternative Energy Specialist
- Voravate Tuntivate, Economist (Social and Statistics)
- Jason Steele, Rural Energy Specialist
- Alfredo Baño Leal, Infrastructure Analyst
- Ren Yi, Accountant

Annex 12: Documents in the Project File

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in Support of the Rural Electrification (APL) Program

A. Project Preparation Study Deliverables

<i>Funding source</i>	<i>Title</i>	<i>Date</i>	<i>Author</i>
IDA	Power System Development Plan	August 2004	Maunsell-Lahmeyer
IDA	REP Design Report	October 2004	Nippon Koei
PHRD	Socio-economic Survey	November 22, 2004	DECON-Systems Europe
PHRD	Rural Electrification Framework Study	November 30, 2004	Maunsell Ltd
PHRD	Tariff Study	December 2004	Electrowatt-Fichtner
PHRD	Power Sector Financing Study	January 2005	Maunsell Ltd.
PHRD	Power Distribution Loss Reduction	March 2005	TEPCO Engineering
ASTAE	Renewable Energy Resource Assessment Preparation and Planning	November 2004	Maunsell Ltd.
ASTAE	DSM/EE Program Development—Program Plan	November 2004	International Institute for Energy Conservation
ASTAE	DSM/EE Study Tour Report	November 2004	Danish Energy Management
ASTAE	Operational Manual	December 2004	Economic Consulting Assoc.
IDA	Procurement Capacity Assessment Report	July 2004	IDA
IDA	Financial Management Appraisal Report	December 2004	IDA
IDA	Economic and Financial Analysis	March 2006	IDA

B. Safeguards Documents

<i>Title</i>	<i>Component</i>	<i>Prepared by</i>
Environmental and Social Safeguard Framework	Grid Extension Subcomponent	EdL
Environmental and Social Safeguard Framework	Grid Extension Subcomponent	MEM
Safeguard Operation Manual	Grid Extension Subcomponent	EdL
Safeguard Operation Manual	Off-Grid Investment program	MEM

C. Other Referenced Documents

<i>Title</i>	<i>Date</i>	<i>Author</i>
Lao PDR: Evaluation of Off-Grid Renewable Energy Electrification Pilot Demonstration Project	December 2003	Economic Consulting Associates
EGAT Power Development Plan (PDP 2004)	April 2004	Generation System Development Planning Dept.
EdL Power Development Plan (PDP 2004–13)	March 2004	System Planning Office, Development Div, EdL
Draft Rural Electrification Fund Decree	October 2004	Prime Minister's Office, GoL
Procurement Plan	January 2005	MEM and EdL
Project Manual—EdL Component	February 2005	EdL
Project Manual—MEM Component	February 2005	MEM
Village Screening Process for Grid-extension Electrification	November 2004	EdL
Audit Reports of EdL Financial Statements, Special Account, and Management Report		
EdL Annual Reports	2003	EdL
EdL Financial Model (electronic version)	2004	EdL
Electricité du Laos Adviser's Final Report, World Bank SPRE Credit No. 3047-LA	May 2004	Resident Financial Management Adviser, PA Consulting Group
Electricité du Laos Adviser's Draft Final Report, World Bank SPRE Credit No. 3047-LA	March 2004	Resident Financial Management Adviser, PA Consulting Group
Electricité du Laos Financial Model and Financial Model Users Manual	May 17, 2003	PA Consulting Group
Electricité du Laos Financial Modeling Assignment, Inception Report	March 13, 2003	PA Consulting Group
Brief on Importance of Information Technology for the Commercial Mandate of EdL	February 6, 2003	EdL
Electricité du Laos, Report on the Revaluation of Fixed Assets	2003	Meritec
Theun Hinboun Power Project, Presentation to Board of Directors	November 2001	Theun-Hinboun Power Company Ltd, Paribas
Power Supply Tariff Study, Draft Final Report	November 2001	Robert Vernstrom
Lao PDR Tariff Study, Progress Report	October 23, 2001	Robert Vernstrom
Proposal to Provide Training on Basic Concepts and Principles of Accounting Electricité du Laos,	September 20, 2001	PriceWaterhouseCoopers
Electricité du Laos, Loss Reduction Programme, Recommendations for Action to Reduce Distribution Losses	August 2001	Meritec
Review of the Contract-Plan of Electricité du Laos for the Period 1997/1999	March 2001	JP Thibaut and P Tardy
Review of Electricité du Laos Financial Model	2001	Dan O'Hearn, Sierra West Consulting
Information Technology Strategic Plan for Electricité du Laos	March 2000	ESBI Consultants Ltd.

Annex 13: Statement of Loans and Credits

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in support of the Rural Electrification (APL) Program

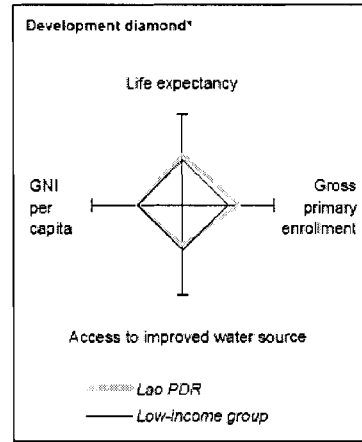
Project ID	FY	Purpose	Original amount (US\$ millions)					Cancel.	Undisb.	Difference between expected and actual disbursements	
			IBRD	IDA	SF	GEF	Orig.			Frm. rev'd	
P110109	2010	Lao PDR PRSO 5	0	20	0	0	0	20.17	0	0	
P101750	2008	Lao PDR Customs and Trade Facilitation	0	6	0	0	0	5.57	-0.03	0	
P087716	2008	LA-Khammouane Development Project	0	9	0	0	0	7.72	0.29	0	
P105331	2007	LA-GMS Power Trade Project	0	15	0	0	0	13.65	2.76	0	
P100081	2006	LA-Avian and Human Influenza Control	0	4	0	0	0	2.5	2.13	0	
P075531	2006	LA-Rural Electrification Phase I	0	10	0	0	0	1.45	-0.27	-7.87	
P074027	2006	LA-Health Services Improvement Project	0	15	0	0	0	7.56	2.87	0	
P090693	2005	Lao Environment and Social Project	0	4	0	0	0	1.52	0.34	0	
P083543	2004	LA-ROAD MAINT APL2	0	22.65	0	0	0	0.14	-0.49	0	
P078113	2004	LA-Second Education Development	0	13	0	0	0	2.03	-0.38	0	
P064886	2003	LA-SUSTAINABLE FORESTRY FOR RURAL DEV.	0	19.9	0	0	0	9.72	-1.82	1.26	
P077620	2002	LA-Fin. Management Capacity Building Cr.	0	11.5	0	0	0	4.58	-0.53	-2.53	
P077326	2002	LA-Poverty Reduction Fund Project	0	34.34	0	0	0	9.32	-8.72	-3.87	
Total:			0	184.39	0	0	0	85.93	-3.85	-13.01	

FY approval	Company	Approvals Pending Commitment			
		Loan	Equity	Quasi	Partic.
Total pending commitment:		0			0

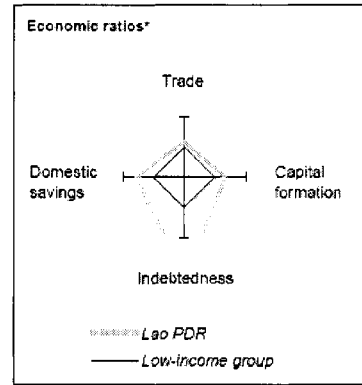
Annex 14: Country at a Glance

LAO PEOPLE'S DEMOCRATIC REPUBLIC Rural Electrification Phase II Project in support of the Rural Electrification (APL) Program

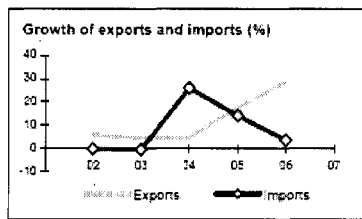
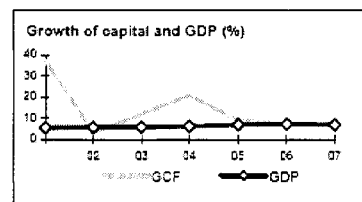
POVERTY and SOCIAL	Lao	East	Low-
	PDR	Asia & Pacific	income
2007			
Population, mid-year (millions)	5.9	1,914	1,296
GNI per capita (Atlas method, US\$)	580	2,180	578
GNI (Atlas method, US\$ billions)	3.4	4,174	749
Average annual growth, 2001-07			
Population (%)	1.6	0.8	2.2
Labor force (%)	2.9	1.2	2.7
Most recent estimate (latest year available, 2001-07)			
Poverty (% of population below national poverty line)	33	..	..
Urban population (% of total population)	30	43	32
Life expectancy at birth (years)	64	71	57
Infant mortality (per 1,000 live births)	59	24	85
Child malnutrition (% of children under 5)	..	13	29
Access to an improved water source (% of population)	60	87	68
Literacy (% of population age 15+)	69	91	61
Gross primary enrollment (% of school-age population)	116	110	94
Male	123	111	100
Female	109	109	89



KEY ECONOMIC RATIOS and LONG-TERM TRENDS	1987	1997	2006	2007
	GDP (US\$ billions)	1.1	1.7	3.4	4.0
Gross capital formation/GDP	10.2	..	32.5	..
Exports of goods and services/GDP	6.1	23.9	36.0	..
Gross domestic savings/GDP	2.3	..	26.2	..
Gross national savings/GDP	2.8	15.4	19.3	..
Current account balance/GDP	-8.6	-10.6	-13.4	..
Interest payments/GDP	0.2	0.4	2.2	..
Total debt/GDP	108.8	132.8	87.7	..
Total debt service/exports	16.1	6.5	13.4	..
Present value of debt/GDP	..	..	68.4	..
Present value of debt/exports	..	..	183.9	..
(average annual growth)				
GDP	6.7	6.3	7.6	7.1
GDP per capita	3.7	4.5	5.8	5.3
Exports of goods and services	..	10.9	28.6	..



STRUCTURE of the ECONOMY	1987	1997	2006	2007
	(% of GDP)			
Agriculture	..	52.8	42.0	..
Industry	..	21.0	32.5	..
Manufacturing	..	15.9	20.9	..
Services	..	26.1	25.5	..
Household final consumption expenditure	89.4	..	64.5	..
General govt final consumption expenditure	8.3	..	9.3	..
Imports of goods and services	14.0	41.3	42.3	..
(average annual growth)				
Agriculture	4.8	3.6	2.0	..
Industry	13.8	11.3	16.5	..
Manufacturing	15.0	9.7	9.2	..
Services	5.7	6.4	6.8	..
Household final consumption expenditure	..	2.9	-4.6	..
General govt final consumption expenditure	..	9.7	17.9	..
Gross capital formation	..	13.8	7.3	..
Imports of goods and services	..	9.8	3.6	..



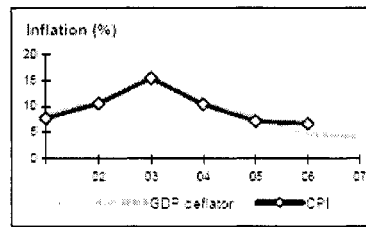
Note: 2007 data are preliminary estimates.

This table was produced from the Development Economics LDB database.

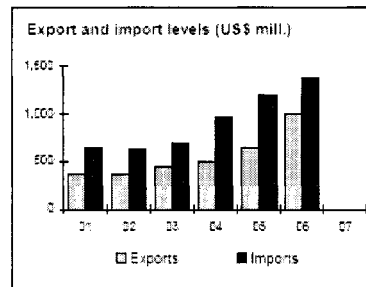
* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

PRICES and GOVERNMENT FINANCE

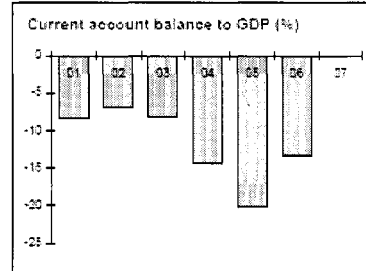
	1987	1997	2006	2007
Domestic prices				
(% change)				
Consumer prices	..	27.6	6.8	..
Implicit GDP deflator	14.5	19.4	4.7	4.1
Government finance				
(% of GDP, includes current grants)				
Current revenue	..	13.5	14.3	..
Current budget balance	..	3.4	5.3	..
Overall surplus/deficit	-4.3	-6.6	-3.6	..


TRADE

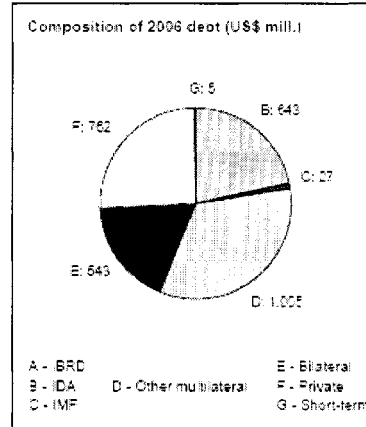
	1987	1997	2006	2007
(US\$ millions)				
Total exports (fob)	43	317	996	..
Electricity	..	21	107	..
Mining	..	..	525	..
Manufactures	..	45	18	..
Total imports (cif)	144	646	1,384	..
Food	..	75	..	..
Fuel and energy	..	76	226	..
Capital goods	..	281	728	..
Export price index (2000=100)	..	..	..	..
Import price index (2000=100)	..	..	..	..
Terms of trade (2000=100)	..	..	..	..


BALANCE of PAYMENTS

	1987	1997	2006	2007
(US\$ millions)				
Exports of goods and services	65	417	1,236	..
Imports of goods and services	147	721	1,453	..
Resource balance	-83	-304	-217	..
Net income	-14	-21	-409	..
Net current transfers	..	140	170	..
Current account balance	-93	-185	-456	..
Financing items (net)	62	155	358	..
Changes in net reserves	..	30	98	..
Memo:				
Reserves (including gold) (US\$ millions)	..	136	336	..
Conversion rate (DEC. local/US\$)	175.1	1,260.0	10,156.9	9,622.1


EXTERNAL DEBT and RESOURCE FLOWS

	1987	1997	2006	2007
(US\$ millions)				
Total debt outstanding and disbursed	1,161	2,320	2,985	..
IBRD	0	0	0	0
IDA	46	356	643	666
Total debt service	10	26	169	..
IBRD	0	0	0	0
IDA	0	3	14	16
Composition of net resource flows				
Official grants	32	192	158	..
Official creditors	163	120	57	..
Private creditors	0	0	15	..
Foreign direct investment (net inflows)	..	86	197	..
Portfolio equity (net inflows)	0	0	0	..
World Bank program				
Commitments	15	46	0	0
Disbursements	5	42	26	27
Principal repayments	0	..	9	11
Net flows	5	41	17	16
Interest payments	0	..	5	5
Net transfers	5	36	12	11



The World Bank Group: This table was prepared by country unit staff; figures may differ from other World Bank published data.

9/24/08



