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PROJECT PAPER

ON A

PROPOSED ADDITIONAL GRANT FROM THE

GLOBAL ENVIRONMENT FACILITY TRUST FUND

IN THE AMOUNT OF US$1.818 MILLION

TO THE

LAO PEOPLE'S DEMOCRATIC REPUBLIC

FOR THE

RURAL ELECTRIFICATION PHASE II PROJECT

January 27, 2011

Lao Infrastructure Sector Unit
East Asia and Pacific Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective December 30, 2010)
Currency Unit = Lao Kip
Kip 8,500 = US$1

FISCAL YEAR
MEM: October 1 – September 30
EdL: January 1 – December 31

ACRONYMS AND ABBREVIATIONS

APL	Adaptable Program Loan	MOF	Ministry of Finance
AusAID	Australian Agency for International Development	MV	Medium-voltage
CAS	Country Assistance Strategy	MW	Megawatt
CO_2	Carbon Dioxide	MWh	Megawatt-hour
DA	Designated Account	NDF	Nordic Development Fund
DOE	Department of Electricity	NORAD	Norwegian Agency for Development Cooperation
DSM	Demand-side Management	P2P	Power to the Poor
EdL	Electricité du Laos	PDO	Project Development Objective
EE	Energy Efficiency	PESCO	Provincial Electrification Service Company
ESMAP	Energy Sector Management Assistance Programme	QCBS	Quality- and Cost-Based Selection
ESSF	Environmental and Social Safeguard Framework	RE	Rural Electrification
GDP	Gross Domestic Product	REF	Rural Electrification Fund
GEF	Global Environment Facility	REP	Rural Electrification (APL) Program
GHG	Greenhouse Gas	REP I	Rural Electrification Phase I Project
GOL	Government of Lao PDR	REP II	Rural Electrification Phase II Project
GWh	Gigawatt-hour	SHS	Solar Home System
ICB	International Competitive Bidding	SPRE	Southern Provinces Rural Electrification Project
IDA	International Development Association	TA	Technical Assistance
JICA	Japan International Cooperation Agency	tCO_2e	Ton of CO_2 equivalent
Lao PDR	Lao People's Democratic Republic	VOPS	Village Off-Grid Promotion and Support Office
LV	Low-voltage	WREA	Water Resources and Environmental Agency
MEM	Ministry of Energy and Mines		

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PROJECT PAPER DATA SHEET

Date: January 27, 2011 Country: Lao PDR Project Name: Rural Electrification Phase II Project ID: P117177 (GEF) and P110978 (IDA)	Team Leader: Jie Tang Sector Director/Manager: Jeeva Perumalpillai-Essex Country Director: Annette Dixon Environmental Category: B

Borrower: Lao People's Democratic Republic
Responsible agency: Electricité du Laos and Ministry of Energy and Mining

Trust Fund estimated disbursements (Bank FY/US$m)

FY	2011	2012	2013
Annual	0.0819	0.879	0.857
Cumulative	0.0819	0.961	1.818

Current closing date: June 30, 2014
Revised closing date: Not applicable

Does the restructured or scaled-up project require any exceptions from Bank policies?	○ Yes ● No
Have these been approved by Bank management?	○ Yes ○ No
Is approval for any policy exception sought from the Board?	○ Yes ● No

The development objectives of the Rural Electrification Phase II are to (a) increase access to electricity of rural households in villages of project provinces; and (b) further improve the financial performance of Electricité du Laos.
The global environmental objectives of the GEF additional financing for the Rural Electrification Phase II are to: (a) increase efficiency of energy supply by Electricité du Laos and consumption by consumers; and (b) adopt substantial renewable energy in the government's rural electrification program. This will reduce greenhouse gas emissions since: (a) the energy savings from increased efficiency will increase clean energy exports to Thailand to substitute thermal power generation in Thailand; and (b) adoption of renewable energy generation for rural electrification will avoid diesel-based electricity generation in rural areas in Lao People's Democratic Republic.

Does the scaled-up or restructured project trigger any new safeguard policies? No

For Additional Financing

[ ] Loan [ ] Credit [X] Grant
For Loans/Credits/Grants:
Total GEF financing (US$m): US$1.818 million
Proposed terms: Grant terms

Original Financing Plan (US$m)

Source	Local	Foreign	Total
BORROWER/RECIPIENT	4.058		4.058
INTERNATIONAL DEVELOPMENT ASSOCIATION		20.000	20.000
INTERNATIONAL FINANCE CORPORATION		3.880	3.880
ENERGY SECTOR MANAGEMENT ASSISTANCE PROGRAM		0.500	0.500
LOCAL COMMUNITIES	3.363		3.363
COFINANCING (NORAD)		4.000	4.000
Sub-Total:	**7.421**	**28.380**	**35.801**
Additional Financing			
GEF	0.518	1.300	1.818
Total:	**7.939**	**29.680**	**37.619**

I. INTRODUCTION

1. This project paper has been prepared for the proposed Global Environment Facility (GEF) financing in the amount of US$1.818 million to the Lao People's Democratic Republic (Lao PDR) as additional financing for the Rural Electrification Phase II Project (REP II) of the Rural Electrification Adaptable Program Loan Program (REP) supported by the International Development Agency (IDA).

2. The proposed additional grant financing from GEF will fund physical investment and technical assistance activities under the REP II to scale up the impacts of the REP II and to achieve global environmental benefits. The activities proposed for GEF support include improving energy efficiency (EE) in both the electricity supply and consumption, promoting adoption of renewable energy in the government's rural electrification (RE) program, and supporting project implementation (with budget for associated project management costs).

3. The REP II was approved by the Regional Vice President and then by the Board on a no-objection basis on January 13, 2010, as the second phase of the Adaptable Program Loan (APL). The REP II, to be implemented over a four-year period (1/2010–12/2013), will continue the same efforts that were addressed under the first phase of the APL—Rural Electrification Phase I Project (REP I), which is a full IDA-GEF blended project and is still under implementation. The REP I was approved in August 2005 with a US$15 million IDA Grant and a US$3.75 GEF Grant. The REP II was also prepared as a fully blended IDA-GEF project up to the Bank's Decision Meeting Stage. The scope of the REP II reviewed at the Safeguard Review at the Decision Meeting Stage, Quality Enhancement Review and the Decision Meeting included the portion proposed for the GEF financing. At the Decision Meeting stage, GEF confirmed that the resource allocation from the GEF 4 to the REP II would be delayed, and it was decided at the Decision Meeting that the GEF portion should be processed separately from the IDA portion once the GEF resources were made available.

4. On March 17, 2010, the GEF Council approved allocation of US$1.818 million from the GEF 4 country allocation to support the proposed activities for GEF Financing.

II. BACKGROUND AND RATIONALE FOR GEF ADDITIONAL FINANCING

5. With a population estimated at 6.3 million in 2009, and growing at the rate of 2.1 percent annually, Lao PDR is characterized by a rich cultural and ethnic diversity where almost half the population—concentrated in the upland areas—belongs to minority groups. About 28 percent of the population was living below the poverty line (with an income of less than US$1.25/day) in 2008. Population density is very low, although it has increased from only 15 people per square kilometer in 1985 to 27 people per square kilometer in 2008. 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).

6. **Progress toward Rural Development and Poverty Reduction.** The Lao PDR has continued to make progress in poverty reduction. GDP growth averaged 6 percent a year between 1990 and 2006, and 7.6 percent per year between 2006 and 2008. The incidence of poverty declined steadily over the last 15 years, from 46 percent in 1993 to 28 percent in 2008. The National Socio-Economic Development Plan 2006–10 of the Government of Lao PDR (GOL) provides an overall development strategy for 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 principal thematic area of the plan. This will be achieved through enlarging economic opportunities, providing 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, with donor-funded programs accounting for nearly 40 percent of total public expenditures.

7. **Rural Electrification.** RE is a major priority of the GOL in the power sector. The GOL has an ambitious goal of electrifying 90 percent of the country's households by 2020 (70 percent by 2010 and 80 percent by 2015). Increasing household connections, from about 16 percent in 1995 to about 45 percent in 2004 and to 69.5 percent by the end of 2009, was a remarkable achievement in the socioeconomic development of the Lao PDR. Through the implementation of four consecutive projects funded by IDA since the mid-1990s, with co-financing from the GEF and the Norwegian Agency for Development Cooperation (NORAD), the planning and implementation capabilities of Electricité du Laos (EdL), the country's electricity utility, for conventional RE have markedly improved. The Australian Agency for International Development (AusAID) has provided additional financing to scale up the capacity building efforts and RE in the country. However, as electrification moves to increasingly remote areas, grid-extension for RE becomes more and more costly, which has led the GOL to promote alternative options, including small scale renewable energy-based mini-grids.

8. **System Loss Reduction.** Remarkable reduction of power system loss has been made in Lao PDR as part of an integral effort to improve EdL's operational efficiency and financial viability over the past five years. As a result of the implementation of the Action Plan for Financial Sustainability of the Power Sector (2005–2011) under the REP I, EdL has reported reduction of distribution system losses from more than 20 percent in 2005 to less than 13 percent by the end of 2009, with investment in loss reduction programs in the order of US$1.0 million per year since 2006. At the same time, EdL has significantly improved its technical capacity in planning, design, and implementation of projects for loss reduction as a result of capacity building under the REP I. EdL aims to reduce its distribution system loss to 10 percent by the end of REP II, with support of the proposed GEF financing.

9. **Demand-side Management and Energy Efficiency.** Demand-side management (DSM) and EE just recently—during the REP I—received attention by the GOL. Under the REP I, a DSM and EE unit was created within EdL; an Action Plan for DSM and EE was prepared by international consultants; and EE initiatives focusing on DSM were

piloted in four government buildings—reaching an 8 percent electricity consumption reduction. Public awareness of DSM and EE is still in its infancy. Continued support is needed for implementation of the DSM and EE Action Plan developed under REP I and to remove the barriers that were identified in the 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-users concerning 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.

10. **Renewable Energy Development.** The renewable energy-based investment programs for off-grid RE supported by the IDA and GEF under the Southern Provinces Rural Electrification (SPRE) and the REP I were very successful in achieving their objectives. The delivery model for solar home systems (SHSs) developed under the SPRE aims to reduce upfront payment by rural families through a hire-and-purchase contract. The SHS program was implemented in the seven southern provinces with five provincial electrification service companies (PESCOs) hired and managed by the Department of Electricity (DOE) of the Ministry of Energy and Mines (MEM) for marketing, planning, installation, and operation and maintenance services. The program has been refined under the REP I and expanded to cover the entire country, with a total of 15 PESCOs created and trained. About 15,000 SHSs have been installed under the SPRE and the REP I and the SHS program is now operating smoothly. By 2012, about 10,000 SHSs additional will be installed at families in remote rural areas under the REP I and II.

11. The government intends to diversify renewable energy development, such as micro hydro-, biomass-, and biogas-based power generation to feed mini-grids in rural areas for RE. During the implementation of the REP I, MEM started to develop a firm regulatory and sustainability foundation, coupled with a sound technology and planning base for public and private sector participation in micro-hydropower development. Supported under REP I, a RE Master Plan has been prepared by the MEM; feasibility studies for 14 micro-hydro sites have been completed; and biomass resource mapping and preparation of pilot projects for biomass- and biogas-based power generation are under way. However, the expected private sector participation in the micro-hydropower development has not yet materialized. Key barriers to public and private investment in small-scale micro hydropower, biomass and biogas projects include (a) detailed government regulations and procedures and incentives for private sector participation not fully in place; (b) limited planning capacity, especially at the local levels and the private sector regarding preparation of integrated cost-effective projects for renewable energy electricity generation, mini-grids for distribution and productive use of electricity; and (c) a lack of private sector capacity for financing, implementation, operation and maintenance.

12. Since the power systems in Lao PDR are inter-connected with the power system in Thailand, additional renewable energy generation and energy savings from increased energy efficiency in Lao PDR will increase clean energy exports to Thailand, substituting for thermal power generation in Thailand. Increased renewable energy generation for

rural electrification will avoid diesel-based electricity generation, as an alternative, in rural areas in Lao PDR.

13. **The REP II.** The project development objectives (PDOs) of the REP II 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 PDOs will be measured by (a) the number of households electrified; (b) the rate of return on revalued assets of EdL; (c) EdL's accounts receivable from government agencies; and (d) EdL's distribution system loss.

14. The REP II continues the same efforts of the on-going REP I, including (a) investment in grid extension and off-grid renewable energy development 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 renewable energy and EE projects; and (d) promotion of private sector participation in sector financing and service provision.

15. The Action Plan for Financial Sustainability of the Power Sector (2005–2011) under implementation as part of the REP I and II focuses on (a) tariff reform to achieve cost recovery and profitability of electricity service supply; (b) adequate budgetary allocations to government agencies and timely payment of electricity bills by government agencies to reduce EdL's accounts receivable from government agencies from 20 months to 3 months; (c) development and implementation of loss reduction programs to reduce EdL's distribution system loss to less than 13 percent; (d) scale-up of the DSM and EE programs; and (e) facilitation of private participation in renewable energy development for RE, with the support of the Rural Electrification Fund (REF) established at the beginning of the REP I.

16. The REP II project has two components under implementation by EdL and MEM respectively.

17. The **EdL component** comprises the following subcomponents:

> **A.1. Grid Extension:** (a) Installation and commission of medium-voltage (MV) and low-voltage (LV) transmission lines, transformers, and in-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 (c) 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 prioritized 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. DSM and EE 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.

18. The MEM component comprises the following subcomponents:

B.1. Off-Grid Investment Program: Application of off-grid renewable energy technologies, including 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 PESCOs and village electricity managers.

B.3. Alternative RE 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.

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

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

19. The existing total financing of the REP II amounts to US$35.80 million, including contingencies, of which US$29.32 million funds the EdL component and US$6.47 million funds the MEM component. The financing sources include an IDA Grant of US$20.0 million (about 56 percent), NORAD co-financing of US$4.0 million (about 11 percent), part of an International Finance Corporation (IFC) loan to EdL of US$3.88 million (about 11 percent), an Energy Sector Management Assistance Program (ESMAP) Grant of US$0.5 million (about 1.4 percent), EdL/MEM counterpart funds of US$4.06 million (about 11 percent), and consumer contributions for in-house wiring and SHS installation of US$3.36 million (9.4 percent).

20. Project design has followed the successful experience of the REP I, which was underpinned mainly by the previous IDA-supported RE projects and the studies financed by the Policy and Human Resources Development Fund 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 RE 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.

21. **The REP I.** The PDOs of the GEF-supported REP I are to: (a) increase access to electricity of rural households in villages of targeted provinces; and (b) improve financial performance of the power sector. The global environmental objectives of the REP I are to achieve: (a) substantial adoption of off-grid renewable energy in the government's RE program; and (b) increased efficiency of energy supply by EdL and consumption by customers, resulting in greenhouse gas (GHG) emissions reductions as increased renewable energy exports substitute for thermal power production in Thailand.

22. **Implementation Status of GEF-supported Activities under the REP I.** The original GEF Grant allocations for various activities are shown in financing plan of the REP I (Table 1).

Table 1: Financing Plan for the REP I

Component	Source (US$ million)						
	IDA	**Co-financing**	**GEF**	**EdL**	**MEM**	**Con-sumer**	**Subtotal**
A. EdL Component							
A.1 Grid extension	5.56	10.00		6.61		4.23	26.40
A.2 Loss Reduction	1.00			1.00			2.00
A.3 Information Technology System	0.80						0.80
A.4 Tariff Reform	0.05						0.05
A.5 Safeguards Capacity Building	0.14						0.14
A.6 DSM and EE			0.75				0.75
Subtotal	**7.55**	**10.00**	**0.75**	**7.61**		**4.23**	**30.15**
B. MEM Component							
B.1 Off-Grid Investment	1.69				0.55	0.13	2.37
B.2 Institutional Strengthening			1.10				1.10
B.3 Alternative RE Delivery Models	0.40		0.30				0.70
B.4 RE Master Plan and Database	0.14		0.85				0.99
B.5 Sector Financing Strategy	0.21						0.21
B.6 Organization Strengthening of DOE of MEM			0.75				0.75
Subtotal	**2.45**		**3.00**	**0.00**	**0.55**	**0.13**	**6.13**
Total	**10.00**	**10.00**	**3.75**	**7.61**	**0.55**	**4.36**	**36.27**
Percentage	27.6%	27.6%	10.3%	21.0%	1.5%	12.0%	100%

23. ***Power to the Poor under the Grid Extension.*** During the project implementation, a portion of the GEF resources (about US$65,000) was reallocated to co-finance with EdL's own resources the preparation and implementation of the pilot Power to the Poor (P2P) program in selected villages in three provinces, which provided interest-free credit support to 537 vulnerable and disadvantaged rural families in villages already electrified for at least one year for connection to the grid. These poor families had remained unconnected to the grid before the P2P because they could not afford the

connection cost of about US$80. The P2P was based on extensive consultations with local communities and the Lao Women's Union, and targeted the poor and woman-headed families and families with disabled members. The P2P program, in a gender sensitive approach, has been scaled up throughout the country and helped increase the access rate in electrified villages from about 60 to 80 percent to almost 100 percent. The broad participation of the targeted disadvantaged rural families makes this program very popular in the country. By December 2010, more than 10,000 disadvantaged families had been connected to the grid through the P2P. Without the GEF resources to initiate the P2P, these rural families would have remained unconnected to the grid and continued using candles, diesel, or kerosene for lighting.

24. ***DSM and EE.*** GEF supported (a) the creation of a DSM/EE cell within EdL; (b) EE awareness generation in the country; and (c) technical assistance for preparation and implementation of EE programs at central government agencies. The implementation of this activity is near completion and is fully satisfactory. The DSM/EE Cell was created within EdL and entered into operation in the early stage of REP I implementation. Associated training programs for capacity building were completed, and the cell hired and managed the international consulting services for (a) EE awareness campaign; (b) initial energy audit of 50 central government agencies; and (c) preparation of a Master Plan for DSM and EE. Following the recommendations of the Master Plan, ten (10) energy coordinators have been hired to provide support to ten (10) major government agencies in implementation of EE practices and adoption of no-cost and low-cost measures for EE, and to prepare detailed energy audit at the four largest hospitals in the country for preparation of investment projects. The REP II will support implementation of low-cost measures at government office buildings and selected priority investment projects for EE. Once these activities are completed, a survey will be conducted to assess the impacts on awareness generation and adoption of EE practices and technologies.

25. ***Institutional Strengthening of the DOE.*** GEF supported hiring (a) a Management Contractor to expand and scale up MEM's off-grid electrification program; and (b) a Quality Assurance Surveyor to supervise and assess the performance of the Management Contractor. The implementation of this activity is fully satisfactory. The Management Contractor helped creation and train ten (10) new PESCOs into full operation. These PESCOs, together with the five (5) PESCOs developed under the SPRE, have completed the installation of 9,900 SHSs under the REP I and have been providing operation and maintenance services to and collecting payments from more than 20,000 rural households with SHSs installed throughout all the 17 provinces under both the SPRE and the REP I. Supervision of the performance of the Management Contractor ensured smooth implementation of the off-grid electrification program.

26. ***Alternative Renewable Energy Delivery Model.*** The GEF-supported Management Contractor hired under the activity above completed (a) a detailed feasibility study of 14 micro-hydropower sites, which could provide electricity for more than 1,000 rural families once completed; (b) a detailed delivery model, including the tariff structure, for these hydropower schemes based on socioeconomic surveys and consultation with local communities; and (c) bidding documents for supply and

construction of the first batch of four hydropower schemes. GEF also supported technical assistance for the review of biomass resource potentials in the country and preparation of an action plan for piloting biomass-biogas technologies in electricity generation.

27. ***RE Master Plan and Database.*** An international consulting firm was hired with GEF resources for (a) developing an initial RE Master Plan (including distributed generation), as well as an RE database, and institutionalizing the capacity for periodic updating; (b) assessing mini-/micro-hydropower and biomass resources; and (c) assessing the rehabilitation of existing mini-/micro-hydropower plants. The RE Master Plan has been delivered in 2010 by the consultant and the RE database is under operation managed jointly by MEM and EdL.

28. ***Organization Strengthening of DOE of MEM.*** GEF-supported consulting services on financial management and procurement, and GEF resources for incremental operational costs of project implementation have ensured the smooth implementation of the off-grid electrification program of the REP I and supported the operation of all SHSs established under both the SPRE and the REP I and the preparation of the off-grid program under the REP II.

29. **Progress towards Achievement of Global Environmental Objectives of REP I.** The global environment objectives and PDOs of the REP I are likely to be achieved within the extended closing dates for the IDA and GEF Grants as indicated by the current status of the key performance indicators in Table 2.

Table 2: Status of Key Performance Indicators of the REP I

	Key Performance Indicators	Target	Progress	Remarks
Global environmental objectives				
1	The "market share" of rural households electrified with off-grid renewable technologies.	19% of newly electrified households.	20.7%	Target exceeded. **GEF co-financed** the installation and operation of IDA-financed goods. Highly satisfactory.
2	Measurable increase in awareness of EE and adoption of EE technologies and practices by government agencies and other consumers.	100% central government agencies, 20% of domestic and 33% of commercial customers aware of EE.	See Item 3 below for progress of the DSM and EE activity under the Implementation of the Action Plan for Financial Sustainability of the Power Sector	Survey to be conducted at the later stage of the REP I to measure the percentages. **100% GEF-supported.** Fully satisfactory.
Project development objectives				
1	Number of villages connected to MV grid.	540	544 (100%)	20% over the household target expected by project completion. **GEF co-financed** the P2P pilot project. Highly satisfactory.
2	Number of households connected to LV network.	42,000	40,681 (97%), including 10,332 disadvantaged rural families connected to the grid under the P2P by December 2010.	
3	Implementation of the Action Plan for Financial Sustainability of the Power Sector: (a) Tariff adjustment plan. (b) EdL system loss reduction. (c) Settlement of arrears. (d) DSM and EE.	 (a) Tariff levels for 2005–10 endorsed by MEM in 2005. (b) 17%. (c) Settlement of arrears up to 09/2005; new arrears less than 3 months. (d) Creation of DSM and EE Cell in EdL; energy audit and implementation of pilot projects; awareness campaign.	 (a) On track. (b) 13% in 2009 (c) Ministry of Finance settlement payments on track; new arrears in about 18 months (d) Completed. Awareness survey to be conducted in 2011.	 **(d) 100% GEF financing.** Fully satisfactory.
4	Number of households and villages electrified with off-grid renewable technologies.	(a) 9,000 by SHSs (b) 1,000 by village hydro and diesel generators. (c) 250 villages.	(a) 9,900 (110%). (b) 0 (feasibility study completed for 14 sites for potential beneficiaries—more than 1,000 families). (c) 200 (80%).	**(a)** 40% over the SHS target expected by project completion. **GEF co-financed** installation, operation and maintenance. Highly satisfactory. **(b) 100% GEF-supported** feasibility study. Fully satisfactory.
5	Establishment and operation of REF.	REF established and operational.	Established and operational.	**GEF co-financed** incremental operating cost. Fully satisfactory.

30. **Rationale for GEF Financing for REP II.** The proposed GEF additional financing will provide a continuation of GEF support to those activities supported by GEF under the REP I. GEF has made a substantial contribution to the REP I in pioneering the development of DSM/EE in the country and supporting electrification through nonconventional renewable energy. The proposed GEF additional financing to REP II is a logical follow-up to its predecessor of an IDA-GEF blended REP I.

31. GEF support to the REP II seeks to promote EE and renewable energy development in Lao PDR. GEF-funded activities will contribute to achievement of the REP II PDOs, bring about additional global environmental benefits through the REP II, and lay the foundations in the country for a more sustainable approach to renewable energy development and DSM/EE in the long term for GHG emission reduction. Specifically, GEF will continue its support to organizational development, capacity building, and institutional arrangements that would overcome the barriers to meeting global environmental objectives.

32. The REP II financed by IDA, NORAD, IFC, ESMAP, counterpart funds, and consumer contributions will support EE improvement on both supply and consumption sides, renewable energy development, and technical assistance to remove barriers to scaling up investment in EE and renewable energy development, creating synergy and scaling up the impacts of the proposed GEF financing in bringing about global environmental benefits.

33. The Water Resources and Environmental Agency (WREA) in the Prime Minister's Office is the GEF National Focal Point. The climate change issues that are of great concern to WREA include the consumption of fossil fuels, especially lignite for power generation and diesel oil by the industry, transport, and agriculture sectors; methane emissions from paddy fields; use of fuel-wood and charcoal in the rural areas; and reforestation and grasslands conservation. The REP I and II closely tie into the GOL's Climate Change Strategy, the objectives of which include: (a) placing greater emphasis on DSM, energy conservation, and EE improvements; (b) fostering more efficient technologies in all fields of the electricity sector; and (c) promoting renewable energy development, such as small-scale hydropower, solar, biogas and biomass energy.

34. The National GEF Focal Point endorsed the proposed GEF financing for the REP (covering the REP I and REP II) in its letter to the IDA dated March 3, 2004 in the total amount of US$5.00 million with US$3.75 allocated for REP I and US$1.25 million allocated for REP II. Because of changes in the amount of GEF resources available, on December 29, 2010, the GEF Focal Point submitted the second endorsement letter endorsing the proposed GEF financing of US$1.818 million to support activities of the REP II.

III. PROPOSED CHANGES

35. **Project Development Objectives.** The PDOs of the REP II, as stated in paragraph 13, will remain unchanged. The proposed GEF additional financing will contribute to achievement of the PDOs and bring about the following global environmental benefits.

36. **Global Environmental Objectives.** The proposed GEF Grant as additional financing to the REP II will support the GOL to: (a) increase efficiency of energy supply by Electricité du Laos (EdL) and consumption by consumers; and (b) adopt substantial renewable energy in the government's rural electrification program. This will reduce GHG since: (a) the energy savings from increased efficiency will increase clean energy exports to Thailand to substitute for thermal power generation in Thailand; and (b) adoption of renewable energy generation for rural electrification will avoid diesel-based electricity generation in rural areas in Lao PDR.

37. The GEF-financed activities would contribute to two GEF climate change operational program objectives: (a) removing the barriers to achieve higher efficiency levels in end-use electricity consumption; and (b) expanding a wider use of renewable energy technologies in rural power supply. Furthermore, the strategies and outcomes that GEF financing will support are closely aligned with two of the six recently adopted Strategic Priorities for the Climate Change Focal Area; specifically: (a) creating power sector policy frameworks supportive of renewable energy and (b) promoting awareness of EE practice and value.

38. ***Key performance indicators*** include (a) reduction of EdL's distribution system loss; (b) measured increase in awareness of EE by consumers; (c) renewable energy generation capacity newly installed; and (d) CO_2 emissions reduction.

39. The existing activities funded by the IDA, NORAD, and ESMAP under the REP II that are critical to achievement of the expected global environmental benefits of the GEF additional financing include (a) technical assistance and investment in EdL's system loss reductions; (b) technical assistance to EdL and investment in DSM and EE; (c) technical assistance to MEM for development and implementation of off-grid electrification program, which supports overseeing and regulating renewable energy development; (d) technical assistance to MEM in alternative renewable energy delivery models through diversified renewable energy technologies including micro-hydropower, biomass, and biogas.

40. **Project Design for GEF Additional Financing.** The proposed GEF Grant as additional financing to the REP II will support activities that (a) will generate global environment benefits; (b) are a natural continuation of the GEF-supported activities under the REP I; and (c) are critical for the achievement of the global environmental objectives and PDOs of the REP II. The grant supports four (4) components closely linked to the selected components of the REP II.

41. **Component 1: EdL System Loss Reduction (US$200,000).** The REP II supports the overall system technical loss reduction program through implementation of the Loss Reduction Master Plan from REP I. The component is co-financed by the IDA, NORAD and EdL. The GEF Grant will contribute to technical assistance in distribution system analysis and preparation of investment projects for technical loss reduction while the IDA and EdL counterpart funding will finance implementation of the investment projects following the recommendations of the technical assistance. It will also support capacity building at EdL, especially its branch offices in the 17 provinces for preparation and implementation of loss reduction activities. The GEF resources will contribute to a 2 to 3 percent reduction of overall distribution system loss below the REP II target.

42. **Component 2: DSM and EE (US$779,000).** GEF co-financing to REP I has supported the hiring of 10 local energy coordinators to review energy saving potentials at 50 central government buildings, the preparation of a DSM and EE Master Plan and detailed energy audits at four hospitals and local markets. The GEF additional financing to REP II will contribute to the implementation of pilot projects identified for energy saving at central government agencies and hospitals and local markets, with co-financing from the IDA and EdL. In addition, the GEF additional financing will be used to continue the employment of the 10 local energy coordinators to prepare a review of energy saving potentials at both the central and provincial government buildings, with co-financing from AusAID (through its additional financing to REP I) and NORAD. In addition, GEF will also fund public awareness campaigns to increase awareness of EE and adoption of EE technologies and practices among targeted consumers.

43. **Component 3: Renewable Energy Development (US$799,000).** The REP II supports the promotion of public and private investment in small scale renewable energy generation. The Finnish Government has supported the development of policies and regulations for promotion of renewable energy development in Lao PDR. The proposed GEF additional financing will finance the design, supply, installation, and supervision of four pilot biogas generation projects in a total capacity of 120 kW, of which pre-feasibility studies have been completed under REP I. The GEF additional financing will also co-finance with IDA and MEM the identification, preparation, and installation of two pilot biomass generation projects to achieve a total installed bio-energy generation capacity of 300 kW (Base Case) during the implementation period of REP II, in addition to replication of the pilot experience for future scale up.

44. The REF established under REP I will provide financial incentives as appropriate to facilitate private investment to scale up the biogas and biomass generation experience accumulated from the pilot projects. Funds from various sources under REP II will be used to hire REF consultants for preparation of the incentive mechanisms, provide technical assistance in preparation of new small hydropower sites, rehabilitation of existing hydropower sites and biogas and biomass projects, and capacity building of local private companies in renewable energy development to facilitate investment. The proposed GEF additional financing will support hiring of renewable energy experts to help development of REF pipeline projects.

Table 3: List of Potential Renewable Energy Projects for Mini-grid Application

	Site name	Estimated Costs	Capacity (kW)	Remarks
Projects Livestock Biogas*				
1	Keo Ittiphon Farm	63,722.00	34	Pre-Feasibility Study
2	Thanongsak Farm	63,722.00	39.5	Pre-Feasibility Study
3	Buakamsawas Farm	31,958.00	17.4	Pre-Feasibility Study
4	Buasawan Farm	45,368.00	30.4	Pre-Feasibility Study
	Sub-total	**204,770.00**	**121.3**	
Micro Hydro Rehabilitation				
1	Nam Et	138,000.00	60	Preliminary Technical Assessment
2	Nam Sat	73,200.00	250	Preliminary Technical Assessment
3	Nam Peun	135,600.00	60	Preliminary Technical Assessment
4	Nam San	156,000.00	110	Preliminary Technical Assessment
	Sub-total	**502,800.00**	**480**	Preliminary Technical Assessment
New Village hydro				
1	Nala	94,544.00	17	Feasibility Study Completed
2	Hang	94,980.00	17	Feasibility Study Completed
3	Pao Neua	113,609.00	15	Feasibility Study Completed
4	Pao Tai	100,242.00	20	Feasibility Study Completed
	Sub-total	**403,375.00**	**69**	
	Total	**1,110,945.00**	**670.3**	

Note: (*) These livestock sites are connected to EdL grid.

45. Given its favorable financial performance, the rehabilitation of existing hydropower sites would be prepared for private investment. Four existing sites, out of operation for a long time and with a total capacity of 480 MW, are identified under the RE Master Plan (2010) prepared under REP I. If the expected private investment can be catalyzed through the technical assistance and REF support, these sites will contribute to global environmental benefits (High Case).

46. **Component 4: Project Management (US$40,000).** This component will provide technical advisory services and incremental operating costs to EdL and MEM to support the project management units of EdL and MEM in the implementation of the project.

47. **Cost Estimation and Financing Plan.** The total cost of the GEF project is estimated at US$10.448 million. The GEF additional financing to the REP II will provide (a) US$0.200 million for technical assistance to technical loss reduction; (b) US$0.779 million for technical assistance and supply and installation of equipments for DSM and EE; (c) US$0.799 million for renewable energy development; and (d) US$0.040 million for project management. The cost estimation and financing plan for the GEF project, which includes GEF additional financing and co-financing under REP II for GEF-supported project components, is shown in Table 4 below. These co-financing sources will benefit and contribute directly to the GEF project outputs and outcomes.

48. GEF additional financing in comparison to the original project financing for REP II is also shown in Table 5 below. The proposed GEF additional financing of US$1.818 million will expand the total REP II financing from US$35.80 million to US$37.62 million.

Table 4: Cost Estimation and Financing Plan of GEF-supported Activities

REP II Component	GEF-Supported Activities	GEF $ m	Co-financing	Total $ m	Remarks
A.2 Loss Reduction	**Component 1: EdL System Loss Reduction**				**Scale up impact**
	· Supply & installation		4.200	4.200	Firms - International & local
	· Technical assistance on technical loss reduction	0.200	0.680	0.880	Firm - International
	Subtotal	**0.200**	**4.880**	**5.080**	
A.5 DSM and EE	**Component 2: DSM and EE**				**Scale up impact**
	· Hiring Energy Coordinators	0.170	0.350	0.520	IC* - local, 10 persons, 24 months each
	· Energy Audits & Training		0.200	0.200	Firm - International
	· EE Pilot Projects	0.598	0.600	1.198	Supply and installation
	· EE Awareness Building Campaign	0.011		0.011	IC – International, 1 month, I travel
	Subtotal	**0.779**	**1.150**	**1.929**	
B.3 Alternative RE Delivery Model	**Component 3: Renewable Energy Development**				**Scale up impact**
	· Biogas / Biomass Pilot project	0.510		0.510	Firm–design/supply international; installation local
	· Technical assistance for supervision	0.100	0.100	0.200	Firm - local
	· Micro hydro – Technical assistance for new		0.280	0.280	
	· Micro hydro – Technical assistance for rehabilitation		0.200	0.200	Firms – supply international; installation local
	· REF Consultant		0.252	0.252	ICs - 2 local, 48 months and 8 travels each
	· Renewable energy experts	0.189		0.189	ICs – local, 48 months biogas, 18 months hydro
	· Technical assistance for productive use of electricity		0.500	0.500	
	· Technical assistance for operation and maintenance of RE database		0.100	0.100	IC - local
	Subtotal	**0.799**	**1.432**	**2.231**	
B.2 Institutional Strengthening	**Component 4: Project Management**				**Scale up impact**
	· Individual consultants for Project management				
	o Management of off-grid electrification		0.500	0.500	Firms - International or local
	o Assistant Project Management Unit Director		0.126	0.126	IC - local, 48 months
	o Project Management Unit /REF Secretary		0.054	0.054	IC - local, 48 months
B.5 MEM Organizational Strengthening	o Financial management		0.150	0.150	IC - local, 48 months, 8 local travels
	o Procurement		0.137	0.137	IC - International, 24 months, 4 travels
	o Training		0.101	0.101	IC – local, 36 months
	· DOE Incremental Operating Cost	0.020	0.100	0.120	Local expenditures
A.5 DSM and EE	· EDL Incremental Operating Cost	0.020		0.020	Local expenditures
	Subtotal	**0.040**	**1.168**	**1.208**	
	Total	**1.818**	**8.630**	**10.448**	
	Percentage	**17%**	**83%**	**100%**	

Note *IC – Individual Consultant (estimated rates of local consultants - about $2,000 - $2,500/month; international consultants - $5,000/month plus hotels and subsistence for short term and $7,000/month including hotel and subsistence for long terms.)

Table 5: GEF Additional Financing vs. Original Financing for REP II

	Activities	Original REP II Financing								GEF Additional Financing	Total
		IDA	NORAD	ESMAP	IFC	EDL	MEM	Consumer	Sub total		
(A)	**EdL Component**										
	A.1 Grid Extension	14.600	0.500		3.880	0.704		3.163	22.847		22.847
	A.2 Loss Reduction	1.000	0.680			3.200			4.880	0.200	5.080
	A.3 Information Technology System		0.300						0.300		0.300
	A.4 Safeguard Capacity Building		0.250						0.250		0.250
	A.5 DSM and EE	0.300	0.750						1.050	0.779	1.829
	EdL Project Management Cost									0.020	0.020
	Subtotal	**15.900**	**2.480**		**3.880**	**3.904**		**3.163**	**29.327**	**0.999**	**30.326**
(B)	**MEM Component***										
	B.1 Off-Grid Investment	4.000					0.154	0.200	4.354		4.354
	B.2 Institutional Strengthening		0.500						0.500		0.500
	B.3 Alternative RE Delivery Models		0.200	0.500					0.700	0.799	1.499
	B.4 RE Master Plan and Database		0.100						0.100		0.100
	B.5 MEM Org. Strengthening	0.100	0.720						0.820	0.020	0.840
	Subtotal	**4.100**	**1.520**	**0.500**			**0.154**	**0.200**	**6.474**	**0.819**	**7.293**
	Total	**20.000**	**4.000**	**0.500**	**3.880**	**3.904**	**0.154**	**3.363**	**35.801**	**1.818**	**37.619**
	Percentage	53%	11%	1%	10%	10%	0%	9%	**95%**	**5%**	**100%**

Note: *Project management costs for the MEM Component are embedded in Component B.2 and B.5.

IV. BENEFITS AND RISKS

49. The project will yield global environmental benefits in two ways: firstly, any reduction of EdL's system loss and energy savings in consumer consumption will increase clean energy exports to or reduce thermal power imports from Thailand, and thus reduce consumption of fossil fuels for power generation in Thailand and GHG emissions. Secondly, RE through mini-grid renewable energy will reduce GHG emissions by substituting for electricity generation by diesel in rural areas. The cost-benefit analysis of GHG reduction is illustrated in Table 6.

50. **Global Environmental Benefits.** It is estimated that the REP II, together with the activities to be supported by the GEF additional financing, will result in a reduction of GHG emissions by 1.07 million tCO_2e (Base Case) to 1.62 million tCO_2e (High Case) over a 10-year economic lifetime for the DSM and EE projects and the loss reduction projects, and 25 years for the renewable energy projects.

51. **Social Benefits.** The GEF additional financing to REP II will also contribute to RE in rural areas, yielding positive social benefits to the rural population, as evidenced through the socioeconomic surveys during the preparation and implementation of the REP I. These surveys illustrated that access to electricity will most likely (a) significantly increase the quality of lighting and disposable income through substitution of more expensive lighting measures; (b) provide increased opportunity for rural households to engage in income generating activities; (c) improve the quality of life through better access to news, information, and entertainment (radios and televisions); (d) extend hours for children to study and for household members to carry out more flexible and productive work in the evenings; and (e) increase women's sense of security at night.

52. **Risks and Mitigations Measures.** The major risks for achieving the project outputs and impacts are (a) the weak capacity of the DOE, which could cause a delay in the implementation of the investment in renewable energy development and associated mini-grid for RE; (b) weak capacity for maintenance, which could cause installed renewable energy facilities to go out of operation; (c) cost overruns from unexpected market price escalations; and (d) management of biomass supply for the potential biomass project.

53. Risk mitigation measures include (a) continuing to employ a consulting firm to assist the DOE in preparation, implementation, and management of the off-grid RE program including the renewable energy development, and hire individual consultants to support the technical, financial management and procurement; (b) hiring the established PESCOs with adequate capacity and satisfactory performance proved under the REP I to support the operation and maintenance of the installed renewable energy generation capacity and associated mini-grid; (c) mainstreaming implementation of the GEF-supported activities together with the REP II activities by the established Project Management Unit within the DOE under the REP I & II; (d) using the latest price information for cost estimation; and (e) close supervision and support by the Bank Task Team. For the potential biomass project, the adequacy of biomass supply poses a specific risk to the sustainability of biomass projects. This risk will be mitigated both by

conducting a site survey of biomass resource potential to ensure sufficient feedstock and developing biomass fuel-supply agreements early in the development of the individual projects. In addition, the project will be developed on a relatively small scale to match resource availability.

Table 6: GHG Reductions and Cost-Benefit Analysis

	Year		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
1	Energy Savings with DSM and EE at Central Government Agencies in 10 years lifespan /a												
	Consumption-central Gov. agencies (GWh)		168.49	190.4	215.1	243.1	274.7	310.4	350.8	396.4	447.9	506.2	
	Base case (15% saving) (tCO_2e)	16%	14,180	16,024	18,107	20,460	23,120	26,126	29,522	33,360	37,697	42,598	261,194
	Base case (KWh)		26,958,395	30,462,986	34,423,175	38,898,187	43,954,952	49,669,095	56,126,078	63,422,468	71,667,389	80,984,149	496,566,873
	High case (30% saving) (tCO_2e)	25%	22,156	25,037	28,292	31,969	36,125	40,822	46,129	52,125	58,902	66,559	408,116
	High case (KWh)		42,122,492	47,598,416	53,786,210	60,778,418	68,679,612	77,607,961	87,696,996	99,097,606	111,980,295	126,537,733	775,885,739
2	EdL System Loss Reduction in 10 years /b												
	Total consumption (GWh)		3618.0	4907.0	6463.4	6743.4	7282.9	7865.5	8494.7	9174.3	9908.3	10700.9	
	Base case (2% loss reduction) (tCO_2e)	2.0%	38,061	51,622	67,995	70,941	76,616	82,745	89,365	96,514	104,235	112,574	790,667
	Base case (KWh)		72,360,000	98,140,000	129,268,000	134,868,000	145,657,440	157,310,035	169,894,838	183,486,425	198,165,339	214,018,566	1,503,168,644
	High case (3% loss reduction) (tCO_2e)	3.0%	57,092	77,432	101,992	106,411	114,924	124,118	134,047	144,771	156,352	168,861	1,186,000
	High case (KWh)		108,540,000	147,210,000	193,902,000	202,302,000	218,486,160	235,965,053	254,842,257	275,229,638	297,248,009	321,027,849	2,254,752,965
3	Renewable Energy-based Generation and Mini Grid for Electricity Supply in 25 years lifespan /c & /d												
	Base case (300 kW) (tCO_2e)	300			868	868	868	868	868	868	868	868	17,358
	Base case (KWh)				657,000	657,000	657,000	657,000	657,000	657,000	657,000	657,000	13,140,000
	High case (780 kW) (tCO_2e)	780			1,367	1,367	1,367	1,367	1,367	1,367	1,367	1,367	29,501
	High case (KWh)				1,708,200	1,708,200	1,708,200	1,708,200	1,708,200	1,708,200	1,708,200	1,708,200	34,164,000
4	Total CO_2 emission reduction												
	Base case (tCO_2e)		52,241	67,645	86,969	92,269	100,604	109,739	119,755	130,742	142,800	156,039	1,069,219
	High case (tCO_2e)		79,248	102,469	132,518	139,747	152,416	166,306	181,542	198,263	216,621	236,786	1,623,617
5	Cost / Benefit Ratio /e		Cost ($ m)	Benefits ($m)		C/B ratio							
	GEF: Base case (US$/$CO_2e$)		1.818	101.27		56							
	GEF: High case(US$/($tCO_2e$)		1.818	155.31		85							
	All Cost: Base case (US$/$tCO_2e$)		10.448	101.27		10							
	All Cost: High case (US$/$tCO_2e$)		12.216	155.31		13							
5	Cost of CO_2 Emission Reduction		Cost ($ m)	Accumulative (tCO_2e)		$/$tCO_2e$							
	GEF: Base case (US$/$tCO_2e$)		1.818	1,069,219		1.70							
	GEF: High case(US$/$tCO_2e$)		1.818	1,623,617		1.12							
	All Cost: Base case (US$/$tCO_2e$)		10.448	1,069,219		9.77							
	All Cost: High case (US$/$tCO_2e$)		12.216	1,623,617		7.52							
6	Assumptions: /a: sharp growth during 2011-2014 due to min industry development; average growth at 8% after 2014 (historically 13.2% over 1995 to 2008);												
	For DSM and EE: Base Case target: 16% and High Case target: 25%. The DSM & EE Master Plan developed under REP I show 8%-25% of energy saving potentials at central government agencies.												
	/b: about $1.1 m/year for 3 years for loss reduction												
	/c: Base Case for Renewable energy: 300kW bio-energy-based generation feeding main grid; 25 years of lifespan;												
	/d:High Case for Renewable energy: 300kW plus rehabilitation of 480kW micro hydro for mini-grid at about $1.769 million; 25 years of lifespan; operating 6 h/day; replacing diesel fuel-based generation.												
	emission factor of a diesel-generation (unit capacity >135 kW) based mini-grid operating 6 hours/day: 0.8 tCO_2e/MWh												
	/e: costs for DSM and EE: (i) $1.8 million for no-cost and low-cost measures; benefits: (i) electricity saving at $0.045/kWh, the importing tariff; (ii) CO_2 emission reduction at $10/$tCO_2e$; (iii) renewable energy generation for mini-grid at $0.1/kWh, retail tariff												

54. **Financial Management.** The same financial management arrangements for the REP I, which are considered adequate, are being applied to the REP II, including the GEF additional financing-supported activities, with a Designated Account (DA) for the GEF Grant administered by MOF. Daily financial management will be handled by EdL and MEM for their respective components. Two EdL financial staff and one MEM government staff have been assigned to handle the financial management tasks of their respective component. The Financial Management Consultant hired by MEM under REP II will assist the financial management of the MEM component. The GEF-funded activities will be integrated as part of the respective EdL and MEM components under the REP II and reported through the quarterly Interim Financial Reports to be submitted to the IDA within 45 days after the end of each quarter as required under the REP II. Similarly, at the end of each year, the DA for the GEF Grant will be audited by independent auditors. The audit reports are to be submitted to the IDA within six months after the end of each fiscal year as required under the REP II. As for the experience and lesson learned from REP I, the audit reports had been submitted late at the beginning of the REP I but compliance to deadline date of submission of audit report has been improved significantly. The latest audit reports for FY2009 have been submitted within the deadline and there is no outstanding audit report. The latest audit opinions are unqualified.

55. **Disbursement Arrangements.** As with the arrangement for the GEF Grant under the REP I, the separate DA denominated in U.S. dollars will be established by MEM to receive GEF funds with the initial advance of US$50,000. Since GEF-financed activities under EdL component are in small amounts, EdL will prepare relevant documents for MEM to process payments from the GEF-DA on behalf of EdL. The project will use transaction-based disbursement procedures, using the DA mainly for small expenditures, with replenishment on the basis of statements of expenditures. Direct payment may also be made for expenditures above the levels for statements of expenditures with full documentation support. The DA should be replenished on a monthly basis to assure liquidity of funds or when the account is drawn down by 20 percent of the initial deposit, whichever comes first. All replenishment applications will be accompanied by reconciled bank statements from the depository bank showing all transactions in the DA. The DA will be audited annually by independent auditors acceptable to the IDA. The projected disbursement schedule is shown in Table 7 below.

Table 7: Projected Disbursement Schedule (million US$)

	FY11 (2010–11)	**FY12 (2011–12)**	**FY13 (2012–13)**	**Total**
Loss Reduction		0.150	0.050	0.200
DSM and EE	0.078	0.390	0.312	0.779
Renewable Energy Development		0.320	0.479	0.799
Project Management	0.004	0.020	0.016	0.040
Planned disbursement per FY	0.082	0.879	0.857	1.818
Total Accumulated Disbursement	**0.082**	**0.961**	**1.818**	**1.818**

56. **Procurement Arrangements.** The same procurement arrangements for the REP II would be applied for GEF-financed activities. The procurement, as part of the REP II implementation work, will be carried out in accordance with the World Bank's *Guidelines: Procurement under IBRD and IDA Credits*, May 2004, revised October 2006 (the Procurement Guidelines); *Guidelines: the Selection and Employment of Consultants by the World Bank Borrowers*, May 2004, revised October 1, 2006 & May 1, 2010 (the Consultant Guidelines); and the provisions stipulated in the Grant Agreement and Project Agreement to be signed with the government and EdL, respectively. The implementation arrangements for procurement and thresholds will remain identical to the ones provided in the REP II, as shown in Table 8. Prior to the signing of the agreements, EdL and the DOE will update the procurement plan to incorporate the contracts to be financed by the GEF Grant. Tentative procurement arrangements for the GEF Grant for Goods and Services are shown in Table 9 and Table 10.

Table 8: 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.

Table 9: Goods Procurement Schedule

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Ref. no.	*Contract (description)*	*Cost estimate (US$m)*	*Procure-ment method*	*Prequal-ification*	*Domestic preferenc e (yes/no)*	*IDA review*	*Bid opening date*	*Comments*
GEF REP II Component 2: DSM and EE								
GEF REP II 1/2	EE equipment	1.198	ICB	No	Yes	Prior	June 2011	
GEF REP II Component 3: Renewable Energy Development								
GEF REP II 1/3	Supply and Installation of Biogas / Biomass Generators	0.510	ICB	No	Yes	Prior	**September 2011**	

Table 10: Consulting Service Procurement Schedule

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Ref. no.	*Contract (description)*	*Cost estimate (US$m)*	*Procur-ement method*	*Pre-qualific ation*	*Domestic preference (yes/no)*	*IDA review*	*Bid opening date*	*Comments*
GEF REP II Component 1: EdL System Loss Reduction								
1	TA and Capacity Building	0.880	QCBS			Prior	June 2011	
GEF REP II Component 2: DSM and EE								
2	Energy Coordinators	0.520	IC				June 2011	
3	EE Awareness Building	0.011	IC				June 2011	
GEF REP II Component 3: Renewable Energy Development								
4	TA for Supervision	0.200	QCBS			Prior	December 2011	
5	Renewable Energy Experts	0.189	IC			Prior	June 2011	

57. **Implementation Schedule.** After the effectiveness of the GEF Grant Agreement for the REP II (expected in May 2011), the implementation of all activities will commence immediately. Most of the contracts are expected to be signed by December 2011. All the contractors should be able to commence their work immediately after the signing and completed the contracts by June 2013.

58. **Closing Date of the IDA Grant for the REP II.** The proposed GEF-supported activities will be implemented within the implementation period of the REP II. The closing date of the IDA Grant for the REP II, June 30, 2014, will remain unchanged.

59. **Safeguard Management.** See section below.

V. CONSISTENCY WITH CAS

60. The REP II—with the proposed GEF additional financing—remains fully consistent with the Country Assistance Strategy (CAS) and supports the current 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 RE. The REP II would also supports the priorities of the GOL's National Socio-Economic Development Plan 2006–10, which seeks, 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 national capacity and institutions.

VI. APPRAISAL SUMMARY

61. **Economic and Financial Appraisal.** Economic and financial appraisals will be carried out for individual renewable energy development projects. Economic justification will be one of the conditions for projects to be approved for implementation. Tariffs and/or subsidies for these projects will be regulated to ensure financial sustainability of the projects. GEF, together with other sources, such as the REF, will provide capital subsidies as needed. In regards to mini-grid renewable energy generation projects, the electricity charges to the beneficiary rural families should consider their affordability and shall be sufficient to cover operating and maintenance costs. Technical assistance will be provided for participation of local communities in operation and maintenance to ensure sustainability of the projects.

62. **Technical Appraisal.** State-of-the-art software and hardware and project evaluation methodologies for reducing technical losses have been employed during the REP I. Adequate international consulting assistance will be engaged to provide technical assistance for continued system analysis and preparation of investment projects for technical loss reduction. Proven technologies and practices will be employed for DSM and EE, and construction and operation of small-scale biogas and biomass generation projects and rehabilitation of existing hydropower sites that are out of service. International consulting services will be provided for energy audit, preparation and implementation of investment projects for DSM and EE and supervision of renewable energy project construction.

63. **Fiduciary Assessments.** Financial management and procurement assessments were carried out for EdL and MEM during the appraisal of the REP II. Since EdL and MEM will also carry out the implementation of the activities under REP II with the proposed GEF additional financing, there is no need to carry out new financial management and procurement assessments (see the Fiduciary Assessment under the REP II).

64. **Policy Exception.** The activities to be funded by the proposed GEF financing are in compliance with the IDA and GEF policies and procedures without policy exceptions.

VII. EXPECTED OUTCOMES AND MONITORING

65. The additional financing will contribute to the objectives and expected outcomes of the REP II. Monitoring and measuring of outputs and impacts will be incorporated as part of the ongoing monitoring and evaluation process under the REP II. Key indicators to measure impacts of the activities proposed for the GEF additional financing are shown in Table 11 and 12. Key indicators include the following:

(i) Reduction of EdL's distribution system loss;
(ii) Measured increase in awareness of EE and adoption of EE technologies and practices by consumers;
(iii) Newly installed renewable energy generation capacity; and
(iv) CO_2 emissions reduction.

Table 11: Results Framework and Monitoring for GEF Grant Additional Financing

Global environmental objectives	*Outcome indicators*	*Use of results information*
1. Increased efficiency of energy supply by EdL and consumption by customers	(a) Reduction of EdL's distribution system loss (b) Measured increase in awareness of EE and adoption of EE technologies and practices by consumers (c) CO_2 Emissions Reduction	• Year 1: Determine effectiveness of technologies and actions • Year 2: Inform EdL's annual investment plan • Year 4: Determine future action plan • Year 1: Assess barriers and inform actions to achieve targets • Years 3–4: Inform policy adjustment to scale up DSM/EE in the country
2. Substantial adoption of renewable energy in the government's RE program	(a) Newly installed renewable energy generation capacity (b) CO_2 Emissions Reduction	• Year 1: Assess potential sites and inform actions to achieve targets • Year 2: Assess potential for scaling up off-grid renewable energy • Years 3–4: Inform policy adjustment to scale up renewable energy development

VIII. FINANCIAL TERMS AND CONDITIONS FOR THE ADDITIONAL FINANCING

66. The standard financial terms for a GEF Grant would apply to the additional financing.

IX. SAFEGUARDS

67. **Safeguards Assessment.** The REP II was prepared as an IDA-GEF blended project covering the above-mentioned GEF-funded activities through the Bank decision stage. However, it then became necessary to prepare these activities for the proposed GEF Grant as additional financing to REP II because of delays in determining the availability of the GEF resources.

68. Given that the appraisal-stage safeguard review and clearance of REP II have covered the proposed GEF-supported activities, the activities for the proposed GEF additional financing would not change the environmental category (currently "B") or trigger any new safeguard policies. The existing safeguard requirements and documents for the REP II, with necessary update, will apply for the GEF additional financing-

supported activities. The documents for REP II have been updated to make them explicitly applicable also to the GEF REP II.

69. **Safeguard Management.** Given that scope of the investment activities to be financed under the GEF additional financing will be limited to renewable energy development to be implemented by DOE and DSM and EE activities at government office buildings and selected hospitals and shopping areas in Vientiane to be implemented by EdL, the safeguard requirements as described in the Environment and Social Safeguard Frameworks (ESSFs) for the REP II-DOE component and EdL component will be applied to this project. The two ESSFs updated by EdL and DOE for application to both REP II and GEF REP II were publicly disclosed in the Bank's InfoShop and in the country on January 19 and 20, 2011 respectively.

70. The same arrangement for safeguard management for REP II, including monitoring and reporting, will be applied for the GEF REP II.

Table 12: Arrangements for Results Monitoring

		Target values		*Data collection and reporting*		
Outcome indicators for global environmental objectives	*Baseline (2010)*	*Year 2*	*Year 4*	*Frequency and reports*	*Data collection instruments*	*Resp. for data collection*
1. Measurable increase in awareness and adoption of EE technologies and practices by consumers	(a) Awareness of EE: 50 government agencies (b) Adoption of EE technologies and practices: no customers	(a) 60% central government agencies; 50 large industrial and commercial customers in Vientiane (b) 25 government agencies; 2 largest hospitals	(a) 100% central government agencies; 100 large consumers in Vientiane (b) 50 government agencies; 4 hospitals; 4 large commercial consumers	Semiannually; project progress reports	• Survey • EdL statistics • Semiannual project progress reports	• EdL
2. Reduction of EdL's distribution system loss	13%	12%	11%	Semiannually; project progress reports	• EdL statistics • Semiannual project progress reports	• EdL
3. Newly installed renewable energy generation capacity	0 MW	0.12 MW	0.30MW	Semiannually; project progress reports	• MEM statistics • Semiannual project progress reports	• MEM
4. Cumulative CO_2 emission reduction	0 tCO_2e	About 100,000 tCO_2e	About 300,000 tCO_2e	Twice over the project period: one for Year 1-2 and one for Year 1-4.	Estimation of CO_2 emission reduction based on data collected for the above three indicators	• EdL & MEM

ANNEX 1: INCREMENTAL COST ANALYSIS

Implementation and Achievements of the IDA-GEF Supported REP I

The REP II project is the second phase of an APL Program initiated with the REP I in 2006. It will build upon the achievements of the REP I and seek to meet the goals set for the REP II under the overall programmatic framework established in the REP I. The following analysis summarizes the results of the REP I, which now becomes the baseline for continued intervention via the REP II, as well as the incremental rationale for continued GEF support to the REP II.

Baseline and REP I Targets. When REP I was appraised in mid-2005, the capacity for providing RE via mini-grid renewable energy-based technologies was rudimentary. The predecessor SPRE had supported the development of a Village Off-Grid Promotion and Support Office (VOPS) activity within the DOE, which had provided SHSs to more than 5,000 households in seven provinces. This was in addition to modest private sector-led SHS leasing schemes and activities by the Japan International Cooperation Agency (JICA) and other bilateral donors that delivered scattered off-grid electrification projects.

The first development objective of REP I was to increase electricity access in targeted provinces. Recognizing the increased cost and difficulty of electrifying remote villages and households with grid-based electrification solutions, the corresponding global environmental objective of the REP was to build the capacity for delivering electrification solutions outside of EdL grid extension, and specifically to increase adoption of off-grid and mini-grid renewable energy in the GOL's renewable energy program (including solar energy) from a baseline (2004) level of 7–10 percent to a 20 percent share while introducing more technology diversity, such as hydro and biomass. The second development objective of REP I was improving the financial performance of the power sector in order to achieve financial sustainability.

The global environmental objective of REP I was to improve supply-side efficiency and to improve EE awareness of demand-side efficiency in important sectors, especially government agencies and commercial and domestic consumers. At REP I project inception, DSM and EE were practically nonexistent in Lao PDR, although EdL had made significant progress in improving the efficiency of supply. Recognizing this low starting point, the targets for DSM and EE were modest—establishing a DSM cell within EdL, developing the end-use database needed for DSM planning, increasing levels of awareness of EE among consumers, and conducting early pilot DSM and EE efforts focused on government agencies.

Achievements of REP I and Contributions of GEF. REP I delivered significant achievements in both off-grid renewable-based electrification and DSM/EE, as highlighted in Table 2 of the main text. The GEF played a pivotal role in disseminating knowledge of and creating capacity in DSM and EE, supporting achievement of the PDOs and global environment objectives of the REP I through US$3.75 million co-financing to the IDA and NORAD funding.

Rationale for Continued GEF Support for REP II

Removing Barriers. Despite significant progress and achievement of REP I targets, much remains to be done in both renewable energy for RE and increasing the EE on both the supply and demand sides. In particular, formidable barriers remain to achieving both environmental objectives of the REP I and II.

DSM and EE just recently—during the REP I—received attention by the GOL. Under the 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 the demand side were piloted in four government buildings reaching an 8 percent electricity consumption reduction. Public awareness of DSM and EE is still in its infancy. Continued support is needed to implement the DSM and EE Action Plan developed under REP I and to remove the barriers, which were identified in the REP I, including the following:

(a) the lack of basic data on electricity consumption and end use patterns by rate class;

(b) the lack of public or private sector capacity for program planning and implementation;

(c) the lack of technical expertise or awareness among end-use customers concerning EE technologies and practices;

(d) the lack of available financing mechanism to support investment; and

(e) little or no appreciation of the benefits of EE.

Loss reduction, on the other hand, has made remarkable improvement in Lao PDR as part of an integral effort to improve EdL's operational efficiency and financial viability over the past years. As a result of implementation of the Action Plan for Financial Sustainability of the Power Sector (2005–11) under the REP I, EdL has reported a reduction in distribution system losses from more than 20 percent in 2005 to about 13 percent by 2009. At the same time, EdL has significantly improved its technical capacity and planning on medium-term loss reduction investment with a plan to invest about US$1.0 million in loss reduction each year.

Renewable energy development, except for solar energy, is limited due to limited local capacity, in both public and private sectors. Most of the donor-funded micro-hydropower projects with mini-grids serving local communities were out of operation because of poor maintenance. Biomass- and biogas-based power generation is in a nascent stage. Without further assistance in building capacity for financing, construction, operation and maintenance, and putting in place adequate regulatory, legal, and institutional arrangements, and an incentive mechanism to encourage private sector participation, it will be difficult to increase the application of small-scale renewable energy schemes in rural areas, where potential resources are available.

Incremental Benefits and Investment Leveraging. GEF support to REP II is modest but fills in important financing gaps by funding the critical technical assistance activities that

will guide both the public and private investments in technical loss reduction of EdL's grids, DSM, and EE at public buildings, hospitals, and local market areas with high potentials for energy saving, and mini-grid based renewable energy development to achieve the PDOs and global environmental objectives of REP II. For renewable energy development, GEF funding is strategic in demonstrating viable projects and business models to encourage future investments in renewable energy development.

For EdL's distribution system loss reduction, GEF will support implementation of EdL's loss reduction program by co-financing with NORAD the critical technical assistance and capacity building on technical loss reduction that will guide EdL's investments in technical loss reduction, as well as leverage additional funding from the IDA, NORAD and EdL to achieve incremental reduction of distribution system loss by about 2 percent to 3 percent. Without the GEF funding, the investment from the IDA, NORAD and EdL would not achieve this additional loss reduction. The IDA and EdL's counterpart funds will be used to support purchase of goods and works for these activities. GEF funding is relatively small compared to the total investment in these activities; however, GEF funding is strategic to fill in the gap of TA needs. The TA will provide the basis for EdL to undertake future investments. It will also strengthen EdL's capacity in planning and implementing loss reduction programs in order to achieve loss reduction targets and maintaining a low-level system loss in the long run. The expected CO_2 emission reduction would be achieved through a combination of TA by GEF and investment by other sources mentioned above.

For DSM and EE, continued support is needed to implement the DSM and EE Action Plan developed under REP I and to remove the barriers that were identified in the REP I mentioned above. GEF's support will leverage additional funding from NORAD and the IDA to yield an overall increase in DSM and EE spending in REP II compared to REP I. GEF co-financing to REP I has supported the hiring of 10 local energy coordinators to review energy saving potentials at 50 central government buildings and the preparation of a DSM and EE Master Plan. The GEF funding to REP II will contribute to the implementation of pilot projects identified for energy saving at central government agencies, with co-financing from the IDA. In addition, the GEF will be continue hiring 10 local energy coordinators to prepare and review energy saving potentials at both the central and provincial government buildings, with co-financing from AusAID (through its additional financing to REP I) and NORAD. These energy coordinators will also provide technical support to the implementation of pilot EE projects and promote EE awareness among energy consumers in government agencies. NORAD will then fund the preparations of full energy audits for prioritized buildings. In addition, GEF will also fund public awareness campaigns to increase awareness of EE and adoption of energy efficiency technologies and practices among targeted consumers. As DSM and EE are fairly new to Lao PDR, sustained funding to DSM and EE will be vital to ensure continuity and momentum, as well as help EdL move from technical assistance to actual implementation. Without the continued funding by GEF for capacity building, awareness generation, and preparation of EE projects, it would be impossible to mobilize resources for investment in DSM and EE. The investment project will result in direct energy saving while the technical assistance is essential to generate environmental benefits after

project completion. Post-project benefits are expected through improved awareness of EE and adoption of EE technologies and practices among targeted consumers.

For EE, the proposed GEF resources of US$200,000 in support to EdL system loss reduction will leverage US$4.88 million from the IDA, NORAD and EdL, at a leverage ratio of 1:24. GEF resources of US$779,000 proposed for DSM and EE component will leverage US$1.15 million from EdL and NORAD, at a leverage ratio of 1:1.5.

For renewable energy development, GEF's support to REP II is modest, but it provides seed money for pilot projects demonstrating viable business models for investments in grid- or mini grid-connected renewable energy projects. Consistent with the GEF-4 policy, GEF will provide support to renewable energy generation in rural areas, especially small hydro installations, biogas, and biomass. Technical assistance under REP I had identified 14 new potential village hydro sites with a total capacity of 436 kW, 38 small hydro rehabilitation projects, two potential biomass sites, and 4 pilot sites for bio-gasification from livestock wastes. The proposed GEF grant will leverage funding from the IDA, NORAD, ESMAP and AusAID for piloting biogas and biomass projects and knowledge dissemination to scale up investment in viable small scale renewable generation capacity. Without the GEF funds, it is unlikely that the expected investment in the pilot biogas and biomass projects (a total capacity of 300 kW) will be made over the REP II implementation period, resulting in the expanding use of diesel fuel for electricity generation for remote applications.

For renewable energy, GEF financing of US$779,000 will leverage US$$1,432,000 from NORAD, ESMAP and AusAID (as an additional financing to REP I) at a leveraging ratio of 1:1.8, without counting the potential private sector investments after demonstration of the GEF-supported pilot projects.

GEF support will also be used to support EdL and MEM in project management to ensure smooth implementation of above activities. The GEF funding of US$40,000 will leverage US$1,168,000 from NORAD and the IDA (1:29), excluding in-kind contributions from the implementing agencies for project management.

Regarding the activities proposed for support by GEF for direct and indirect contribution to the achievement of global environmental objectives, the total GEF funds of US$1.818 million will leverage US$8.630 million from various sources, at an overall leveraging ratio of over 1:4.7.

Global Environmental Benefits

The proposed GEF additional financing to REP II will ensure the achievement and scale-up of the global environmental benefits of REP II.

Loss Reduction. GEF-supported technical assistance will leverage resources and contribute to the EdL system loss reduction program, achieving additional 2 to3 percent reduction in system loss. Environmental benefits will be achieved by avoiding thermal-dominated generation in Thailand with reduced import.

DSM and EE. GEF funding will leverage resources for investment in pilot DSM and EE projects, restringing energy saving of 16 to 25 percent savings in the public sector. The energy savings will avoid the same amount of thermal-dominated generation in Thailand with reduced import. GEF-funded technical assistance will bring about future investment in DSM and EE, resulting in post-project global environmental benefits.

Renewable Energy Development. GEF funding will support installation of grid-connected biogas generation in about 120 kW and biomass generation capacity in about 180 kW to save import of thermal-dominated generation in Thailand.

GHG Emission Reduction. It is estimated that the REP II, together with the activities to be supported by the GEF additional financing, will result in a reduction of GHG emissions by 1.07 million tCO_2e (Base Case) to 1.63 million tCO_2e (High Case) over a 10-year economic lifetime for the DSM and EE projects and the loss reduction projects, and 25 years for the renewable energy projects, without counting the post-project environmental benefits stated above.

Social Benefits

The GEF additional financing will also contribute to the RE in rural areas under REP II to bring electricity services to 37,700 rural households. This will yield positive social benefits to the rural population, as evidenced through the socioeconomic surveys during the preparation and implementation of the REP I. These surveys showed that access to electricity will most likely achieve the following:

(a) Significantly increase the quality of lighting and disposable income through substitution of more expensive lighting measures;
(b) Provide increased opportunity for rural households to engage in income generating activities;
(c) Improve quality of life through better access to news, information, and entertainment (radios and televisions);
(d) Extend hours for children to study and for household members for more flexible and productive work in the evenings; and
(e) Increase women's sense of security at night.

Table 13: Global Benefits of GEF Support to REP II

Component	*Basis* [1]	*Baseline*	*GEF alternative*	*Carbon benefits as a result of GEF support*
Loss reduction	2011 domestic generation: 3,618 GWh. Each MWh of Thai thermal production would generate 0.526 tCO_2.	Without GEF support, the additional loss reduction of 2 to 3 percent would not be achieved.	Additional loss reduction starting from 2011: **Base case:** 2% **High case:** 3%	CO_2 emissions reduction over a 10-year lifetime of loss reduction investments : **Base case** 790,667 tCO_2e; **High case** 1,186,000 tCO_2e
DSM/EE	2011 public sector consumption: 168.49 GWh. Each MWh of Thai thermal production generates 0.526 tCO_2e.	The pilot DSM and EE projects at government agencies for about 16-25% energy saving will not be implemented without GEF support.	Implementation of pilot DSM and EE projects in the public sector and technical assistance for scale up: **Base case:** 16% **High case:** 25%	CO_2 emissions reduction over a 10-year lifetime of DSM and EE investments: **Base case:** 261,194 tCO_2e; **High case:** 408,116 tCO_2e
Renewable energy development in rural areas	Diesel generators (>135kW) operating for 6 hours a day. Each MWh electricity production by diesel generates 0.8tCO_2e	Without GEF support, the pilot biogas and biomass generation projects for about 0.3 MW total capacity will not be implemented.	Installation of grid-connected biogas generation and mini-grid connected biomass generation; and technical assistance expecting to result in private investment in rehabilitation of existing hydropower project in 0.48kW: **Base case:** 0.30 MW **High case**: 0.78 MW	CO_2 emissions reduction over a 25-year lifetime of renewable energy generation: **Base case:** 17,358 tCO_2e **High case:** 29,501 tCO_2e
Total				**Base case:** 1,069,219 tCO_2e **High case:** 1,623,617 tCO_2e
Cost to GEF				**Base case:** US$1.70/ tCO_2e **High case:** US$1.12/ tCO_2e

Note: 1. CO_2 emissions factors for Thailand taken from *Standardized Baselines and Streamlined Procedures for Selected Small-Scale Clean Development Mechanism Project Activities: A Guide for Project Developers*. Netherlands Ministry of Housing, Spatial Planning and Environment, December 2001.