

**GLOBAL  
ENVIRONMENT  
FACILITY**

**MOHAMED T. EL-ASHRY**  
CHIEF EXECUTIVE OFFICER  
AND CHAIRMAN

January 13, 1997

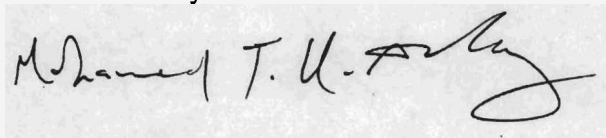
Dear Council Member:

The World Bank, as the Implementing Agency for *Sri Lanka - Energy Services Delivery Project*, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with World Bank procedures.

Over the next four weeks, the Secretariat will be reviewing the project document to ascertain that it is consistent with the proposal included in the work program approved by the Council in April 1996, and with GEF policies and procedures. The Secretariat will also ascertain whether the proposed level of GEF financing is appropriate in light of the project's objectives.

If by February 10, 1997, I have not received requests from at least four Council Members to have the proposed project reviewed at a Council meeting because in the Member's view the project is not consistent with the Instrument or GEF policies and procedures, I will complete the Secretariat's assessment with a view to endorsing the proposed project document.

Sincerely,



cc: Alternates, Implementing Agencies, STAP

project document in accordance with World Bank procedures.

Over the past few years, the Secretariat has been reviewing the project document in accordance with the Bank procedures.

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# OFFICE MEMORANDUM

RECEIVED

97 JAN -6 AM 9: 32

DATE: January 2, 1997

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TO: Mr. Mohamed T. El-Ashry, CEO and Chairman, GEF

FROM: Robin Broadfield, Acting Chief, Global Environment Division

EXTENSION: 3-4355

SUBJECT: **Sri Lanka Energy Services Delivery Project  
Final GEF Council Review/CEO Endorsement**

Please find attached 75 copies of the Project Document for this operation for circulation to Council Members prior to your final endorsement. The document is in the new streamlined format the Bank is currently piloting, which has been adapted to present the project's consistency with the GEF's objectives, operational strategy and procedures.

The project's objectives and scope are consistent with those outlined in the document that the GEF Council reviewed and approved for entry into the GEF Work Program at its April 1996 meeting. However, during project appraisal it was agreed that the Ceylon Electricity Board could not effectively utilize the volume of capacity-building resources envisaged in the initial project design. Consequently, the project's capacity-building component was scaled down from \$2.8 to \$1.1 million, the project's agreed incremental costs were re-estimated, and the requested GEF grant has consequently fallen from \$7.3 to \$5.9 million.

In commenting on the project proposal, Council members asked that the final document: (a) spell out the project's link to Sri Lanka's GHG mitigation strategy; and (b) explain how the Bank's and GEF's experience with PV solar home systems projects is reflected in the project's design. Block 2, section 6 addresses the first of these issues and block 2, section 10 the second. A Council member also queried the project's sustainability. The strategy for achieving sustainability is spelled out in block 3 section 20.

We would appreciate a copy of your outgoing letter to Council members for our records.

cc. Al Duda, Dilip Ahuja (GEFSEC); Mac Cosgrove-Davies (Asia Region)





**DRAFT  
CONFIDENTIAL**

**GEF PROJECT DOCUMENT**

**SRI LANKA**

**ENERGY SERVICES DELIVERY PROJECT**

**December 30, 1996**

**Energy and Project Finance Division  
Country Department 1  
South Asia Region  
The World Bank**

DRAFT

CONFIDENTIAL

PROJECT DOCUMENT

ENERGY DELIVERY PROJECT

December 30, 1988

Division

Energy and Project F  
County Department 1

State Rep  
Bill B...

## CURRENCY EQUIVALENTS

Currency Unit = Sri Lankan Rupee (Rs.)

US\$1.00 = Rs 53 (July 1996)

### Fiscal Year

Government of Sri Lanka and Commercial Banks  
Development Finance Corporation of Ceylon

January 1 to December 31  
April 1 to March 31

ADB	Asian Development Bank
ASTAE	Asia Alternative Energy Unit
ASTEN	Asia Technical Department, Environmental and Natural Resources Division
AU	Administrative Unit
AWDR	Average Weighted Deposit Rate
BOC	Bank of Ceylon
CAS	Country Assistance Strategy
CBOC	Commercial Bank of Ceylon
CBSL	Central Bank of Sri Lanka
CEA	Central Environment Authority
CEB	Ceylon Electricity Board
DFCC	Development Finance Corporation of Ceylon
DFI	Development Finance Institution
DSM	Demand Side Management
EA	Environmental Assessment
ESD	Energy Services Delivery
FIL	Financial Intermediation Loan
GDP	Gross Domestic Product
GEF	Global Environment Facility
GOSL	Government of Sri Lanka
ICB	International Competitive Bid
IRR	Internal Rate of Return
ITDG	Intermediate Technology Development Group
KW	Kilowatt
kWh	Kilowatt-hour
MOF	Ministry of Finance
MW	Megawatt
MW <sub>p</sub>	Megawatt Peak
NBF	Not Bank Financed
NCB	National Competitive Bid
NDB	National Development Bank
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organization
O&M	Operations and Maintenance
OED	Operations Evaluation Department
PCI	Participating Credit Institution
PE	Pre-Electrification
PFDP	Private Finance Development Project
PHRD	Policy and Human Resource Development
PPA	GEF Project Preparation Advance
PPF	Project Preparation Facility
PV	Photovoltaic
SA1EF	South Asia Country Department 1, Energy & Project Finance Division
SHS	Solar Home System
SIL	Specific Investment Loan
SOE	Statement of Expenses
SPPA	Standard Power Purchase Agreement
TA	Technical Assistance
UNDP	United Nations Development Programme
W <sub>p</sub>	Watts Peak

Vice President:	D. Joseph Wood
Director:	Mieko Nishimizu
Division Chief:	Per Ljung
Staff Member:	Loretta Schaeffer

**Sri Lanka**  
**Energy Services Delivery Project**

**TABLE OF CONTENTS**

<b>PROJECT FINANCING DATA.....</b>	<b>1</b>
<b>BLOCK 1: PROJECT DESCRIPTION .....</b>	<b>2</b>
1. Project development objectives .....	2
2. Project components .....	2
3. Benefits and target population .....	3
4. Institutional and implementation arrangements .....	3
<b>BLOCK 2: PROJECT RATIONALE.....</b>	<b>6</b>
5. CAS objective(s) supported by the project .....	6
6. Main sector issues and Government strategy .....	6
7. Sector issues to be addressed by the project and strategic choices .....	7
8. Project alternatives considered and reasons for rejection .....	7
9. Major related projects financed by the Bank and/or other development agencies .....	8
10. Lessons learned and reflected in the project design .....	9
11. Indicators of borrower commitment and ownership .....	9
12. Value added of Bank and GEF support .....	10
<b>BLOCK 3: SUMMARY PROJECT ASSESSMENTS.....</b>	<b>11</b>
13. Economic Assessment .....	11
14. Financial Assessment .....	12
15. Technical Assessment .....	13
16. Institutional Assessment .....	14
17. Social Assessment .....	15
18. Environmental Assessment .....	15
19. Participatory Approach .....	15
20. Sustainability .....	16
21. Critical Risks .....	17
22. Possible Controversial Aspects .....	18
<b>BLOCK 4: MAIN LOAN CONDITIONS.....</b>	<b>18</b>
23. Effectiveness Conditions .....	18
24. Other .....	18
<b>BLOCK 5: COMPLIANCE WITH BANK POLICIES .....</b>	<b>19</b>

**List of Annexes:**

- 1 Project Design Summary
- 2 Detailed Project Description
- Draft Operating Policy Guidelines for the ESD Credit Program
- 3 Estimated Project Costs
- 4A Cost Benefit Analysis Summary, Pilot (3MW) Windfarm Component
- 4B Cost Benefit Analysis Summary, Solar Home Systems Representative Subproject
- 4C Cost Benefit Analysis Summary, Village Hydro Representative Subproject
- 4D Cost Benefit Analysis Summary, Mini-Hydro Representative Subproject
- 5 Financial Summary
- 6 Procurement, Disbursement and Auditing Arrangements
- 7 Project Processing Budget and Schedule
- 8 Documents in the Project File
- 9 Status of Bank Group Operations in Sri Lanka
- 10 Sri Lanka at a Glance
- 11 Environmental Data Sheet
- 12 Country Map of Sri Lanka
- 13 Incremental Cost Analysis

South Asia Region  
Country Department 1

## Project Appraisal Document

Sri Lanka  
Energy Services Delivery (ESD) Project

Date:	December 30, 1996	<input checked="" type="checkbox"/> Draft	<input type="checkbox"/> Final
Task Manager:	Loretta Schaeffer	Country Manager:	Roberto Bentjerodt
Project ID:	LK-PA-10498 (IDA) LK-GE-39965 (GEF)	Sector:	Energy POC: Environment, Private Sector
Lending Instrument:	FIL/SIL	PTI:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**Project Financing Data** ☒ Grant ☐ Loan ☒ Credit ☐ Guarantee

**For Loans and Credits:**

Amount (US\$m/SDRm): US\$24.2 million equivalent/SDR \_\_\_\_\_ million

**For Grants:**

Amount (US\$m/SDRm): US\$5.9 million equivalent/SDR \_\_\_\_\_ million

**Proposed Terms:**

Grace period (years): 10 years

☐ Multicurrency

☐ Single currency

☐ Standard  
Variable

☐ Fixed

☐ LIBOR-based

Years to maturity: 40 years

Commitment fee: Standard (a variable rate between 0 and 0.5% of the undisbursed credit balance set annually by the Executive Directors of IDA)

**Financing plan (US\$m):**

Source	Local	Foreign	Total
Government	1.9	0	1.9
Participating Credit Institutions	5.5	8.2	13.7
Entrepreneurs	4.0	5.6	9.6
Global Environment Facility (GEF)	2.1	3.8	5.9
IDA	9.1	15.1	24.2
<b>Total</b>	<b>22.6</b>	<b>32.7</b>	<b>55.3</b>

Borrower: Democratic Socialist Republic of Sri Lanka

Guarantor: N/A

Responsible agency(ies): Ministry of Finance (MOF), Ceylon Electricity Board (CEB)

Estimated IDA disbursements (Bank FY/US\$m)	1997	1998	1999	2000	2001	2002
Annual	0	2.6	3.4	5.4	6.6	6.2
Cumulative	0	2.6	6.0	11.4	18.0	24.2

Estimated GEF disbursements (Bank FY/US\$m)	1997	1998	1999	2000	2001	2002
Annual	0	0.8	0.9	1.5	1.5	1.2
Cumulative	0	0.8	1.7	3.2	4.7	5.9

Expected effectiveness date: June 1997

Closing date: Dec. 2002

## Block 1: Project Description

### 1. Project development objectives (see Annex 1 for key performance indicators):

#### Project Development Objectives:

- a) promote the provision by the private sector, NGOs and cooperatives of grid-connected and off-grid energy services using environmentally sustainable renewable energy technologies;
- b) strengthen the environment for DSM implementation; and
- c) improved public and private sector performance to deliver energy services through renewable energy and DSM.

#### Project Global Environmental Objective:

Mitigation of carbon emissions in Sri Lanka through displacement of fossil fuels by non-carbon emitting renewable energy technologies and demand side management.

### Selected Performance Indicators (see Annex 1 for key performance indicators):

- a) Installation of at least 26 MW of grid and off-grid renewable energy capacity including service to 32,000 off-grid customers;
- b) CEB issuance of Energy Efficient Commercial Building Code of Practice (EECB); and
- c) (1) CEB annual update of Small Power Purchase Tariff (SPPT); (2) signing by CEB of at least 5 SPPA contracts by mid-term evaluation; 12 by project completion; and (3) generation planning models prepared by CEB which incorporate intermittent, non-dispatchable renewable energy generating sources.

### 2. Project components (see Annex 2 for a detailed description and Annex 3 for a detailed cost breakdown):

Component	Cost Incl. Contingencies (US\$M)	% of Total
<u>The ESD Credit Component</u> , channeled through private Participating Credit Institutions (PCIs), would provide medium and long-term financing to private sector firms, NGOs, and cooperatives for solar home system and village hydro pre-grid electrification, grid-connected mini-hydro schemes, and other renewable energy investments. Grant cofinancing from the Global Environment Facility (GEF) would be available for solar home system and village hydro subprojects.	48.9	88.0
<u>The Pilot Grid-Connected Wind Farm Component</u> would finance a CEB-executed pilot grid-connected wind farm project of approximately 3 MW. This pilot project is expected to demonstrate the commercial viability and long-run economic potential of wind power in Sri Lanka, and to catalyze future private sector windfarm development.	3.8	7.0
<u>The Capacity Building Component</u> would provide training and technical support for renewable energy and energy efficiency initiatives by both the public and private sector.	2.6	5.0
<b>Total</b>	<b>55.3</b>	<b>100.0</b>

### 3. Benefits and target population:

**Benefits.** *The primary direct project benefits are:*

- i) the addition of about 26 MW of environmentally sustainable generating capacity, including electricity services to up to 32,000 rural customers through solar home systems and village hydro schemes. This comes at a time of severe capacity shortfall, when CEB is aggressively pursuing thermal power capacity additions.
- ii) development of sustainable markets for grid and off-grid renewable energy technologies.
- iii) strengthening of demand side management and energy conservation capabilities within the CEB and the Sri Lankan architecture/engineering community.
- iv) for the GEF eligible technologies (village hydro and solar home systems), benefits include the value of the positive environmental externality resulting from using these technologies, instead of conventional technologies.

*The primary programmatic benefits are:*

- i) incorporation of environmentally sustainable renewable energy technologies within the planning framework for grid-connected power generation (wind, and mini-hydro) and pre-grid rural electrification (solar home systems and village hydro).
- ii) acceptance by consumers, project developers and financial institutions of the viability of grid and off-grid renewable energy systems for electricity production and delivery.
- iii) incorporation of DSM and energy efficiency measures in standard building design practices.

### **Beneficiaries**

Mini-hydro - Estate management companies and other private investors

Solar Home Systems and Village Hydro - Private investors, non-governmental organizations (NGOs), or village cooperatives will provide energy services to currently unserved rural households

Wind Farm and Capacity Building - Ceylon Electricity Board (CEB)

### 4. Institutional and implementation arrangements:

**Implementation period:** Five years (1997-2002)  
**Executing agencies:** Ministry of Finance, Ceylon Electricity Board  
**Project coordination:** Ministry of Finance

The ESD Credit Program Component - The GOSL would onlend the proceeds of the credit component to eligible PCIs, which would, in turn, onlend these proceeds, along with complementary financing out of their own resources, to eligible subborrowers. Proceeds of the IDA credit may be used for subloans.<sup>1</sup> The GOSL has selected the Development Finance Corporation of Ceylon (DFCC) to create an Administrative Unit (AU) to administer the Credit Program. The GOSL and the DFCC are currently negotiating an Administration Agreement. The AU would be responsible for (i) administration of the Credit Program; (ii) administration of the GEF grants; and (iii) technical assistance related to off-grid subprojects. The Credit Program would support subprojects up to 5 MW in capacity per project. (Larger projects could seek financing via the Private Sector Infrastructure Development [PSID] Project. -- Cr. 2880-CE.) US\$5.0 million of the Credit Program proceeds would be reserved for off-grid subprojects (e.g., solar home system and village-hydro schemes) until the Mid-Term Review which would consider the need for continued earmarking of funds. The maximum IDA refinancing amount under the Credit Program would be US\$3.0 million per project or the PCI's single borrower exposure limit, whichever is

<sup>1</sup> Subloans may also include lease investments.

lower. Operating policy guidelines and proposed on-lending arrangements for the ESD Credit Program are patterned after those used in the ongoing Private Finance Development Project (PFDP – Cr. 2484-CE) and are presented in Annex 2. These guidelines define the onlending mechanism, including the onlending rate, the terms and conditions, the responsibility of the Administrative Unit, procurement procedures, disbursement procedures, and audit requirements. Eligibility criteria for PCIs, including commercial banks, development finance institutions (DFIs), merchant banks, and leasing companies, are given in Annex 5, Part 1.

The onlending rate to PCIs would be a variable rate equal to the Average Weighted Deposit Rate (AWDR) of all interest-bearing deposits of the domestic commercial banks, or another appropriate rate to be determined during project implementation by GOSL in consultation with IDA. The GOSL would assume the foreign exchange risk. The onlending rate to PCIs would be adjusted semi-annually to reflect market conditions. PCIs would assume the credit risk and set their own lending rates in agreement with their clients. Subloan maturities would vary according to individual subprojects but would not exceed 10 years, including a maximum 2-year grace period. Private enterprises, NGOs and cooperatives operating in Sri Lanka are potentially eligible subborrowers, subject to PCI credit-worthiness assessment.

In addition to administering the Credit Program component, the AU would administer GEF grant funds to: (i) support off-grid subproject preparation activities; (ii) cofinance off-grid subprojects; and (iii) provide off-grid project support through promotional activities, provision of grant funding for verification of solar home systems, and consumer education and protection.

The final date for submitting subproject applications to PCIs will be three years after Credit Effectiveness. The closing date for disbursement will be five years after Credit Effectiveness. Each subproject proposal would include a timetable for implementation.

GEF Technical Assistance (TA) grants would be available to help project developers prepare feasibility studies, business plans and bank loan documentation for off-grid subprojects. Grants would be disbursed on a reimbursement basis up to 90% of the cost of preparation of a solar home system subproject (up to US\$6,500) and 95% of the cost of consulting services for preparation of a village hydro subproject (up to US\$9,000). Reimbursement would be triggered by PCI approval of a subproject on the basis of a bank loan application package supported by a complete feasibility study/business plan, and presentation of eligible expenses and submission of subloan disbursement request equal to or exceeding the GEF grant amount. Only expenses incurred after September 1, 1996 would be eligible for reimbursement. Each subproject developer would be eligible for only one grant.

#### The Wind Farm Component:

- The CEB will be responsible for implementing the Pilot Grid Connected Wind Farm Component. An Engineer, Procure, and Construct (EPC) contractor will be selected by the CEB to implement the wind farm on the basis of an international competitive bid, subject to IDA guidelines. The EPC contractor would provide one year of system operation as well as operations and maintenance training to CEB staff.
- The CEB Pilot Wind Farm Project Manager would report to the CEB Additional General Manager (Planning) and oversee all phases of subproject procurement and operation. These include the bidding process, negotiations, contract award, installation, training of CEB staff, acceptance testing, system turnover, operations, maintenance, monitoring, and preparation of semi-annual performance reports.
- The onlending rate to the CEB for the Wind Farm Component will be 14% with a 17-year maturity including 2-year grace.

#### The Capacity Building Component:

- The CEB, through its Additional General Manager (Planning) will oversee the capacity building activities of the Pre-Electrification (PE) Unit and the DSM Unit



### **Project oversight (policy guidance, etc.):**

The CEB will submit to IDA at the beginning of each calendar year, evidence of public announcement of the annual Standardized Small Power Purchase Agreement (SPPA) non-negotiable Tariff update.

### **Accounting, Financial Reporting and Auditing arrangements:**

#### The Credit Program Component

- The AU will maintain the ESD Credit Program-related statistical records, incorporating, among other things, (i) approval of subprojects and disbursement made in respect thereof; (ii) classification of subprojects by grid-connected hydros, off-grid village hydros, solar home systems and others; (iii) classification of subprojects by size and geographical distribution; and (iv) classification of subloans and grants approved by size, maturity pattern and geographical distribution.
- The AU will maintain separate disbursement records and accounts with respect to each PCI under the ESD Credit Program; keep on file supporting disbursement documents as well as bank accounts relating to disbursements; and maintain a Project Account. All records, documents and accounts are to be maintained in accordance with sound accounting practices for independent audits and for review by IDA and GEF missions.
- The AU will prepare/submit quarterly statistical reports on the ESD Credit Program and other periodic reports (including semi-annual PCIs' loan collection performance reports) as required by GOSL and IDA.
- An annual external audit is required of the Project Account and Special Account, and a separate opinion on Statement of Expenditures (SOEs), not later than four months after the close of each fiscal year
- An annual external audit is required of each PCIs' financial statements, within four months of the end of the fiscal year, and to confirm their continued compliance with the PCI eligibility criteria.

#### The Pilot Wind Farm and Capacity Building Components

- The CEB will submit to IDA audited project expenditures (Statement of Expenditures and Special Account) within six months of CEB's fiscal year end.
- The CEB will submit to IDA unaudited financial accounts within 4 months, and audited accounts within 6 months of fiscal year end.
- The CEB will ensure that invoices from the EPC contractor are paid in accordance with the CEB/EPC contract.
- The CEB will maintain a record of invoices and financial records for the EPC contract and Pilot Wind Farm operation in accordance with sound accounting practices.
- The CEB will provide GOSL and IDA semi-annual reports on the pilot wind farm and capacity building components presenting the progress achieved during the semester against the implementation plan agreed with IDA from time to time.

### **Monitoring and Evaluation arrangements:**

#### General

- IDA will review progress under the project on the basis of periodic reports provided by the AU and the CEB and mount supervision missions for comprehensive review of progress in project implementation (including performance indicators).
- In addition to its regular supervision, IDA and the GOSL will jointly conduct a Mid-Term Review about two years after the Credit Effectiveness. The Review would examine emerging best practices as well as constraints, if any, to project implementation and ways to address these constraints.

#### The Credit Line Component

- To ensure achievement of Project outputs, particularly the supply of electricity to rural customers, US\$5.0 million would be reserved for off-grid subprojects until the Mid-Term Review which will assess the need for reallocation or continued earmarking of funds for off-grid subprojects.
- IDA will examine and approve the eligibility of potential PCIs and monitor the eligibility status of approved PCIs on the basis of periodic reports submitted by each PCI through the AU.

- IDA will also review all subproject proposals (including the related environmental assessment) above the "free limit" established for each PCI. IDA will provide comments on them promptly, and approve them as appropriate, assuring itself that they are consistent with the developmental objectives of the ESD Project and Operating Policy Guidelines for the ESD Credit Program and GEF Grant funds.

#### The Pilot Wind Farm and Capacity Building Components

Regarding these two CEB executed components, IDA will:

- approve selection of the Pilot Wind Farm Engineer, Procure, and Construct (EPC) contractor, after verifying that the selection has followed IDA procurement guidelines.
- review semi-annual reports concerning the Pilot Wind Farm and monitor progress in procurement, construction, and operation of the Pilot as well as related private sector wind power development.
- monitor the progress of and review draft materials prepared by the DSM and PE Units, including the Code of Practice for Energy Efficient Commercial Buildings, DSM Implementation Strategy, brochures, training programs, etc.
- facilitate assistance to the CEB from electric power utilities with relevant experiences in grid-interconnection and modeling of non-dispatchable power generation sources.
- provide prior authorization for all goods, works, and services expenditures under the Capacity Building component.

## **Block 2: Project Rationale**

### **5. CAS objective(s) supported by the project:**

Document number and date of latest CAS: 15633-CE, May 21, 1996

- The proposed project supports the three IDA objectives of enhancing: **(i) environmentally sustainable energy development; (ii) promoting private sector delivery of energy services; and (iii) enhancing efficiency in the power sector.**
- ESD investment and TA support for small-scale private power investments would complement the Private Sector Infrastructure Development (PSID) Project (Cr. 2484-CE), which is designed for large-scale investments. Together, these projects further IDA's objective of encouraging private sector investment in infrastructure projects.
- IDA's objective of improved efficiency in the power sector would be supported by: (i) development of least-cost grid-connected and off-grid renewable energy resources based on avoided cost principles; and (ii) capacity building in renewable energy and DSM.

### **GEF Operational Program Supported by the Project:**

- The GEF Operational Program 6 objective of promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Implementation Costs is a primary focus of the project and would be supported through the ESD Credit Program, Pilot Wind Farm, and Capacity Building components.

### **6. Main sector issues and Government strategy:**

Public sector investments in power generation have lagged behind Sri Lanka's rapidly growing demand. Investments in core infrastructure have increased marginally since 1990, to about 4.5% of GDP. However, this level remains well below levels in other lower and lower-middle income countries such as Indonesia (5.5-6%), Thailand (6-6.5%), and the Philippines (7%)<sup>2</sup>. In contrast, demand for power continues to increase at 8% or more annually. Daily power cuts in 1996 underscore the urgent need for new generating capacity and improved efficiency.

The GOSL strategy for redressing these deficiencies has two components: (i) creation of a regulatory and policy environment which encourages private investments to supplement public resources; and (ii) improving the efficiency of energy services delivery. To this end, the CEB has contracted with Price Waterhouse under a PHRD grant to examine the

<sup>2</sup> Sri Lanka in the Year 2000 - An Agenda for Action, Joint Sri Lankan and World Bank Study, March 1996.

legal and regulatory framework and policy incentives required to promote private sector participation in power sector development. Also, IDA has initiated a study on power sector restructuring to review problems and issues and recommend suitable restructuring strategies for the sector. These studies will support a separate GOSL exercise to articulate long-term sector reform strategy and a Policy Paper on Power Sector Reform.

#### **GEF Focal Area Issues and Government Strategy:**

The GOSL recognizes the global significance of greenhouse gas emissions from power generation based on fossil fuels. A key element of the national energy strategy, endorsed by the National Environmental Action Plan (NEAP) is to optionally develop energy resources in a least economic cost and environmentally sound manner. This strategy is further developed in the report, *"Climate Change in Asia: Sri Lanka,"* wherein the Sri Lankan Ministry of Environment and Parliamentary Affairs has identified renewable energy and energy efficiency as key elements in Sri Lanka's greenhouse gas mitigation strategy.

#### **7. Sector issues to be addressed by the project and strategic choices:**

In light of the GOSL strategy noted above, the project would enhance the enabling environment for : (i) private investments in renewable energy services delivery through development of a standardized small power purchase agreement and non-negotiable tariff, lack of which effectively impeded development of small grid-connected power projects; and (ii) DSM implementation. The project would also enhance awareness of renewable energy services by consumers and the private sector. It would help the financial community become familiar with renewable energy projects which tend to be perceived as high commercial risk projects. Market development supported by the Project also will address the high transaction costs associated with an underdeveloped local marketing distribution and servicing network.

#### **8. Project alternatives considered and reasons for rejection:**

- **Public vs. Private Sector implementation** - An alternative project design was considered which relied heavily on public sector delivery of renewable energy services. For off-grid (PV and village hydro) subprojects, the CEB could have maintained ownership of the equipment, adopting a tariff schedule sufficient to maintain its standard rate of return on investment and thereby reducing the cost for such off-grid services to the ultimate beneficiary (the rural households). The private sector's role would have been confined to supply of equipment and services. However, even before the current capacity shortfall, CEB has experienced difficulties in utilizing IDA financing due to management weakness and a cumbersome procurement process. The recent power shortage has compounded CEB's difficulties and spurred GOSL to investigate options for restructuring the power sector. This is expected to result in greater private sector participation in the power sector and an altered role for the CEB or its successor(s). Given this situation, the GOSL (including the CEB) and IDA mutually agreed that the ESD Project objectives would best be met with a private sector delivery approach.
- **Additional Renewable Energy Technologies** - In addition to the Pilot Wind Farm component, the ESD Project would support village hydro, mini-hydro, and photovoltaic technologies through the Credit Program. While the Credit Program Operating Guidelines do not exclude other technologies (such as biomass and solar thermal), these are not expected to be supported by the ESD Project because of market and/or technical immaturity. Biomass power systems, for example, show good technical promise, but have not yet demonstrated commercial market viability in Sri Lanka. Enhancing the basis for commercial development of biomass power is one of the aims of the parallel UNDP/GEF-assisted Renewable Energy and Energy Efficiency Capacity Building Project (see para 9 below).
- **Alternative size of the Credit Program Component** - Given the large number of potential subprojects already identified and the strong interest expressed by seven potential PCIs (paras 3 through 5 of Annex 2), a larger credit program could have been pursued to meet the potential demand. However, it was decided that the amount allocated for this component would be set at a size that would be large enough to adequately justify the proposed administrative and financial arrangement and yet small enough to ensure a reasonable pace of disbursements. Taking these criteria into account and the availability of IDA funds for the project, an allocation of US\$19.7 million equivalent is considered a reasonable amount for this component.
- **GEF Baseline Options** - Grid-connected renewable energy systems (e.g., Pilot Wind Farm and mini-hydro) would displace the fossil-fired generators which are CEB's marginal generating units. Therefore, the GEF baseline would be

greater reliance on fossil fuels. The baseline for off-grid renewable energy systems (e.g., solar home systems and village hydro) would be kerosene lighting, and power generation from diesel and grid-connected battery charging stations.

**9. Major related projects financed by the Bank and/or other development agencies (completed, ongoing, and planned)**

**Bank Projects:**

Private Development Finance Project - PFDP - (Cr. 2484-CE) - Credit line through commercial banks and DFIs for general industrial development. The ESD Credit Program is patterned after the PFDP credit line, and would use many of the same PCIs. The PFDP funds are fully committed and the Project is expected to close on time (Board approval: April 20, 1993; Closing date: June 30, 1999; Latest Form 590: May 20, 1996; Project Development Objective Rating: Satisfactory; Implementation Progress Rating: Satisfactory).

Second Power Distribution and Transmission Project (Cr. 2297-CE) - The Project supports: (i) rehabilitation of distribution systems; (ii) expansion of the CEB transmission facilities; and (iii) CEB institutional strengthening. (Board approval: September 10, 1991; Closing date: June 30, 1998; Latest Form 590: June 6, 1996; Project Development Objective Rating: Satisfactory; Implementation Progress Rating: Satisfactory).

Private Sector Infrastructure Development Project (Cr. 2880-CE) - Subordinated debt facility to support large-scale infrastructure projects undertaken by the private sector. (Board approval: June 13, 1996; Closing date: June 30, 2002; Latest Form 590: May 20, 1996; Project Development Objective Rating: Satisfactory; Implementation Progress Rating: Satisfactory).

India Renewable Resources Development Project (Ln. 3544-IN) - The Project includes a line of credit with the Indian Renewable Energy Development Agency (IREDA) to finance private sector development of small-hydro power systems, wind farms, and solar photovoltaic systems. (Board Approval Date: December 17, 1992; Closing date: December 31, 1999; Latest Form 590: June 7, 1996; Project Development Objective Rating: Satisfactory; Implementation Progress Rating: Satisfactory).

Indonesia Renewable Energy for Small Power (RESP) Project (ID-PE-42882) - The Project will support utility (i.e., PLN) owned and operated mini-hydro and mini-geothermal power facilities as well as private sector biomass cogeneration investments which will sell power to a regional PLN grid under the published Small Power Purchase Agreement. (Board Presentation Scheduled for March 28, 1997).

Indonesia Solar Home Systems Project (ID-PE-35544) - This Project consists of two major components: (i) a credit component, comprising an IBRD loan and a GEF grant, to enable the purchase of solar home systems by rural households and commercial establishments on an installment plan basis; and (ii) technical assistance, including support of detailed monitoring and evaluation activities during project implementation. (Board Presentation Scheduled for January 14, 1997).

**Other Projects:**

UNDP/GEF Sri Lanka Renewable Energy and Energy Efficiency Capacity Building Project - This parallel UNDP/GEF project would complement the ESD Project with capacity building efforts in the areas of: i) small hydro and wind resource assessment and project preparation; ii) biomass technology commercialization; and iii) strengthening of local capacity in small hydro and DSM. (see Project File for Project Document).

Second Power System Expansion Project - This ADB-assisted project for CEB and Lanka Electric Company (LECO) supports rural electrification as well as expansion of power transmission and distribution systems. (ADB Board approval: December 14, 1995; Closing date: December 31, 2000).

Plantation Rehabilitation Project - This ADB-assisted Project includes a \$60.0 million credit for tree crop plantation development, processing improvement and pollution control. The Project also would provide about \$6.0 million for service vehicles and equipment including rehabilitation of micro-hydro power plants. (ADB Board approval: November 9, 1995).

#### 10. Lessons learned and reflected in the project design:

- Solar home system projects must: (i) overcome the first cost barrier created by their high initial cost (relative to conventional alternatives) to gain an adequate potential market size; (ii) establish responsive and sustainable PV sales and distribution infrastructure; and (iii) provide quality products and services. (World Bank Technical Paper Number 324, Best Practices for Photovoltaic Household Electrification Programs, 1996) Solar home system subprojects supported by the ESD Credit Program will offer consumer level financing to address the first cost barrier and market size issues, allowing dealers to create the necessary infrastructure. All solar home systems will be required to comply with technical specifications, ensuring quality products and services.
- Solar home system projects should: (i) operate on a full cost-recovery basis, (ii) provide adequate consumer information, and (iii) ensure adequate management skills in local implementing organizations. (World Bank Technical Paper Number 304, Photovoltaic Applications in Rural Areas of the Developing World, 1995) All solar home system subproject proposals will be reviewed by the lending PCI as well as the Bank. These elements will be included in the reviews.
- Implementation of a small power purchase agreement (SPPA) tariff, derived from (i) published purchase prices not to exceed the utility's avoided cost; and (ii) standard and efficient small power market are central to the realization of a sustainable and efficient small power market (Indonesia Second Rural Electrification Project; Ln. 3845-IND). An approved SPPA and tariff have been approved by the CEB before Credit negotiations.
- Community ownership of village hydro schemes results in a sense of ownership, improves the self-help capabilities of the village, strengthens community relations within the village, and promotes environmental awareness. (Consultancy and Professional Services (Pvt.) Limited, "Review of Existing Village Hydro Schemes," July 1995, see Project File) Community ownership has been the norm for Sri Lankan village hydro schemes to date and is expected to continue with the Project.
- Rigorous economic and financial analysis of rural electrification projects and an increased attention to cost recovery are key to successful project implementation. (OED Report #13291, Rural Electrification in Asia: A Review of Bank Experience, June 1994) Economic and financial analyses are required for all ESD Credit Program subprojects.
- Demonstration of commercial renewable energy technologies can remove information barriers and facilitate widespread replication. The wind farm component of the India Renewable Resources Development Project (Ln. 3544-IN/Cr. 2449-IN) has helped finance 26 MW of wind capacity to date, and has catalyzed commercial development of an additional 470 MW. (Mid-Term Evaluation Report of the India Renewable Resources Development Project, November 1995) This is a fundamental tenet of ESD Project design.
- Government incentives, including taxes, duties, and subsidies, must be consistent with national and sectoral objectives for maximum long-term impact. (Mid-Term Evaluation Report of the India Renewable Resources Development Project, November 1995.) During ESD Project preparation, the GOSL agreed to rationalize import duties on photovoltaic modules, thus removing a major barrier to utilization of this technology.
- CEB procurement delays and shortage of experienced staff can result in serious implementation problems. (May 1996 Supervision Report of the Sri Lanka, Second Power Distribution and Transmission Project, Cr. 2297-CE) CEB's involvement in ESD procurement has been minimized. Advanced action on Pilot Wind Farm EPC procurement has demonstrated CEB willingness to move quickly on this component.

#### 11. Indicators of borrower commitment and ownership:

##### Ministry of Finance

- Request for and utilization of PPF funds for financing of two off-grid pilot subprojects (one village hydro, one solar home system) through commercial channels;
- Rationalization of import tariff for photovoltaic modules;

- MOF request for retroactive financing of off-grid subprojects; and
- MOF request dated March 20, 1995 for GEF support of the ESD Project (see Annex 14).

#### **Ceylon Electricity Board**

- Use of PPF funds for: (i) preparation of a Feasibility Study and Tender Package for the Pilot Wind Farm, and (ii) preparation of a DSM Action Plan.
- Creation of a Pre-electrification Unit to provide technical support and training for the ESC Credit Program subproject development and a Demand Side Management Unit to implement DSM activities.
- Preparation of a Standard Small Power Purchase Agreement (SPPA) and Non-Negotiable Power Purchase Tariff for small (under 10 MW) private power producers such as grid-connected mini-hydro.
- Collaborative CEB/Urban Development Authority/ private sector preparation of a DSM Action Plan.
- Issuance of a General Procurement Notice for the Pilot Wind Farm.

#### **Ministry of Environment**

- Preparation of a National Environmental Action Plan
- Endorsement of request for GEF support for the ESD project

#### **Private Sector/NGO**

- Request for retroactive financing.
- Strong interest in the ESD Credit Program expressed by private domestic banks, two development finance institutions (DFIs), and one merchant bank, all of which appear to meet eligibility criteria for participation.
- Review and comment on technical specifications for off-grid (solar home system and village hydro) installations.
- Preparation of subprojects for ESD Credit Program financing. Projects under preparation to be ready by ESD Project effectiveness (May 1997) include 3 solar home system, 2 village hydro, and at least 5 mini-hydro schemes.

#### **12. Value added of Bank and GEF support:**

- Instrumental in rationalization of PV module import tariff (the tariff previously set at 35%, is now 10%, consistent with other similar commodities)
- Assistance in preparation of Standard SPPA and Non-Negotiable Power Purchase Tariff for small power producers
- Assistance in preparation of technical specifications for solar home system and village hydro schemes.
- Advice on design of private sector renewable energy investments.
- Catalyst for public and private sector cooperation on DSM actions, including a Code of Practice for Energy Efficient Commercial Buildings and Load Research initiatives.
- Catalyst in mobilizing grant support of alternative energy development in Sri Lanka:
  - \$1.5 million from the GEF and \$335,000 from the UNDP for the parallel UNDP/GEF Sri Lanka: Renewable Energy and Energy Efficiency Capacity Building Project



### Block 3: Summary Project Assessments (Detailed assessments are in the project file. See Annex 8)

13. Economic ☒ Cost-Benefit Analysis ☐ Cost Effectiveness Analysis  
Assessment (see Annex 4):

- Economic assessments were performed in constant dollars for the Pilot Wind Farm as well as representative ESD Credit program subprojects (solar home system, village-hydro, and mini-hydro). Results are given below:

#### Net Present Value (NPV) of Pilot Wind Farm and Representative Credit Program Subprojects (12% Discount Rate)

Component	NPV (\$ Millions)	EIRR
Pilot Wind Farm	0	12%
ESD Credit Program		
Solar Home System	0	12%
Representative Village Hydro Subproject (8.5 kW serving 100 households)	0	12%
Representative Mini-Hydro Subproject (580 kW, grid-connected)	.87	18%

Note:

- For the GEF-eligible technologies of wind, solar home systems, and village hydro, GEF grants are included as economic benefits in accordance with OP 10.04. While in the long-term, these technologies will be economically lower in cost than conventional alternatives, initial investments in infrastructure and market creation are required. For off-grid systems (PV and village hydro), the conventional alternative is kerosene lighting and automotive batteries for operating radios and televisions. For wind, the conventional alternative is the marginal generating unit on the CEB grid. The GEF grant size was calculated as the "incremental cost" necessary to make the current economic costs of the renewable energy technologies equal to the conventional alternatives. This results in a zero net present value. (See Annex 4 for detailed analyses.)
- In the case of off-grid subprojects (PV and village hydro), the economic benefits were based on the avoided expenditures in kerosene lighting and battery use. Additional benefits accrue to the household from increased convenience and safety, improved indoor air quality, and a higher quality of light (more consistent illumination, better color rendering). However, since data is insufficient to calculate these benefits, they are not included in the analyses. Experience gained in this and other projects (e.g., the proposed Indonesia Solar Home Systems Project), may permit quantification of these benefits for future projects.

**Fiscal Impact** (for all ESD components): The project does not burden the GOSL with any subsidies. Instead, the project would result in a positive fiscal impact on the economy by:

- Generating revenues from taxes and duties on private sector subprojects;
- Reducing government investment in grid-connected generation in the longer term by promoting private investment;
- Promoting private supply of off-grid power to rural households with full cost recovery and no GOSL subsidy, as compared with the conventional subsidy required for grid-connected household rural electrification; and
- Reducing pressure for government investment in uneconomic extension of the rural power grid.
- The Small Power Purchase Tariff is based on CEB avoided costs of energy, and as such, creates a payment stream which is sustainable from CEB's perspective, and reliable from the project sponsor's perspective.

**Incremental Cost:** The Project has an estimated GEF incremental cost of \$5.9 million as summarized below. For details, see the incremental cost analysis given in Annex 13.

	<u>Baseline</u>	<u>GEF Alternative</u>	<u>Unit Incremental Cost</u>	<u>Quantity</u>	<u>Total Incremental Cost</u>
Solar Home System Investments	Household expenditures for kerosene and automotive batteries at a present value of \$650 per household	Solar Home System with a lifecycle cost of approximately \$750	\$100 per system	30,000 systems	\$3.0 million
Solar PV Subproject Preparation	Zero. This activity would not have been undertaken without the ESD Project	Consultant assistance for subproject preparation	\$6,500	about 15	\$100,000
Village Hydro Investments	Household expenditures for kerosene and automotive batteries at a present value of \$27,000 per 120 households	Village hydro system at a present value of \$33,000	\$6,000	about 20	\$120,000
Village Hydro Subproject Preparation	Zero. This activity would not have been undertaken without the ESD Project	Consultant assistance for subproject preparation	\$9,000	about 20	\$180,000
Off-Grid Subproject Support	Zero. This activity would not have been undertaken without the ESD Project	Off-Grid Project Promotion, solar home system design verification, solar home system installation verification, consumer education and protection facility	\$550,000	-	\$550,000
Pilot Wind Farm	Operation of marginal generating units (fossil-fuelled gas turbines and diesel generators)	Pilot wind farm of approximately 3 MW	\$880,000		\$880,000
CEB Pre-Electrification Unit Support	About \$150,000 in staff and hardware expenses	Consultants and hardware for expanded training and off-grid subproject support activities	\$320,000	-	\$320,000
CEB Demand Side Management (DSM) Support	DSM program of about \$1.15 million	Code of Practice for Energy Efficient Commercial Buildings, Load Research Program, capacity building	\$750,000	-	\$750,000
<b>Total</b>					<b>\$5,900,000</b>

#### 14. Financial Assessment (see Annex 5):

Participating Credit Institutions (PCIs) for the ESD Credit Program should meet the eligibility criteria, presented in Annex 5, which are currently used under the ongoing Private Finance Development Project (Cr. 2484-CE). The criteria require, among other things, (a) compliance with Ministry of Finance/ Central Bank guidelines on prudential regulations, capital adequacy, classification of risk assets, provisioning, single borrower exposure limits, sector exposure limits, and disclosure



and reporting requirements; (b) fulfillment of such specific financial soundness criteria as a minimum cash collection ratio of 80%, a minimum return on average equity of 9%, a maximum portfolio affected by arrears as a percentage of total portfolio of 20%, a maximum debt equity ratio of 8:1, minimum capital adequacy ratios of 4% and 8% for tier-1 and tier-2, respectively as required by the Central Bank. PCIs should also be privately owned and controlled.

Detailed financial data presented by four domestic private commercial banks, two development financial institutions (DFIs) and one merchant bank confirm their ability to meet the eligibility criteria. These institutions have expressed strong interest in ESD Credit Program participation. Statistical highlights of their financial standing and performance are provided in Annex 5. A detailed assessment of their eligibility is available in the Project File.

Financial analyses were performed for the Pilot Wind Farm as well as representative subprojects. Results are summarized below. (See Annex 5)

#### Financial Internal Rate of Return (FIRR) of Pilot Wind Farm and Representative Credit Program Subprojects

<u>Component</u>	<u>FIRR</u>
Pilot Wind Farm	21%
ESD Credit Program	
Solar Home Systems	20%
Representative Village Hydro Subproject (8.5 kW serving 100 households)	12%
Representative Mini-Hydro Subproject (580 kW, grid-connected)	20%

- The financial analyses were performed from the perspective of the subproject sponsor to confirm the financial viability of proposed subproject categories. Import duties and taxes, income tax, and financing costs all were included in subproject costs.
- Benefits for the Pilot Wind Farm and mini-hydro plants were taken as the price the CEB is willing to pay of the energy produced (capacity credit was not included).
- The analysis for the solar home system subproject reflects the assumptions given in the business plan for the pilot subproject, financed by the Project Preparation Facility. Since the NGO sponsoring this subproject has prior experience in solar home system programs, their estimated financial benefits, reflecting willingness to pay as shown by the proposed customer payments, was used in the financial analysis.
- The pilot village hydro subproject is the first village hydro to use commercial financing (all previous village hydros relied on donor funding). Since the consumer surplus associated with village hydro is unknown, the financial analysis conservatively assumed only the avoided financial cost as benefits. The economic and financial rates of return are essentially equal because the "sweat equity," included in the economic but not the financial analysis, counterbalances the other costs included in the financial analysis.

#### 15. Technical Assessment:

The renewable energy and DSM technologies supported by the ESD project are technically sound and demonstrated worldwide. Technical viability is further supported by Sri Lanka's prior experience with mini-hydro, village hydro, and solar home systems, and by resource and feasibility studies for wind power.

##### Mini-Hydro

- The CEB has recently begun accepting power from two privately-developed mini-hydro plants (the 1.2 MW Dik Oya Plant and the 140 kW Deniyaya facility). In addition, the Chief Electrical Inspector has issued letters of preliminary approval for 10 additional sites. As of January 1994, there were approximately 60 isolated mini-hydro facilities serving tea plantations.

- A World Bank-assisted study confirms the technical, economic and financial viability of rehabilitating at least 100 grid-connected mini-hydro schemes (under 2 MW) on tea estates.
- Conservative CEB estimates indicate a potential of about 90 MW for mini hydro (under 10 MW). A national hydropower assessment, currently underway, is expected to identify additional opportunities.
- As of July 1996, 37 potential (grid-connected) mini-hydro subprojects have been identified with capacities ranging from 250 kW to 4,665 kW that would add about 35 MW to the CEB grid.

#### **Village hydro**

- The systems range from 0.5 to 25 kW, at an average all-inclusive cost of \$275/household. These systems already serve about 20 isolated Sri Lankan villages in hilly areas with high rainfall. Existing village hydro schemes have been installed and managed by village cooperatives, with assistance from donor-supported Integrated Rural Development Projects, NGOs and the National Development (formerly Janasaviya) Trust Fund (Poverty Alleviation Project, Cr. 2231-CE).
- Under the GEF Project Preparation Advance (PPA), more than 30 villages have requested preparation assistance for off-grid village hydro subprojects which range in size from 1.5 to 60 kW and, in total, could serve nearly 4,800 households.
- In addition, a call for expressions of interest by Intermediate Technology Development Group (ITDG - a local NGO active in village hydro), has yielded requests from about 140 villages for assistance in developing their own village hydro schemes. While all of these may not be technically or economically viable, they provide an indication of existing village hydro market potential.

#### **Solar Home Systems**

- Since 1982, about 5,000 individual solar home systems have been installed in Sri Lanka at an all-inclusive cost of \$300-\$700/household. This initial market activity has produced a nascent local PV supply industry.
- Approximately 300,000 Sri Lankan rural households currently use automotive batteries to power lights, televisions and radios. These households represent a first market for off-grid solar home systems and village hydro subprojects. The proposed Project will also provide pre-grid renewable energy services to some of the additional 1.4 million households in rural Sri Lanka without grid access.
- Under the GEF PPA, four developers are already preparing solar home system subprojects and two others have expressed interest. Projected sales of about 37,000 systems over a five-year period are indicated by currently available solar home system business plans.

#### **Wind**

- Wind resources in coastal areas of the Hambantota District were closely measured from 1987 to 1993. These measurements indicate an average windspeed of 6.8 meters per second at 40 meters, sufficient for commercial development of wind power in the Hambantota area. A recent consultant report has concluded that wind resources in the region could support up to 200 MW of commercial wind power development. The CEB is currently utilizing an IDA Project Preparation Facility (PPF) to complete a feasibility study and prepare a bid package for the Pilot Wind Farm.

### **16. Institutional Assessment:**

#### **a. Executing agencies and Project management**

- **MOF/DFCC - ESD Credit Program:** The Ministry of Finance (MOF) has satisfactorily implemented IDA credit programs. As in previous programs, the MOF has chosen to contract out the day to day administrative duties to the ESD Credit Program and has selected the Development Finance Corporation of Ceylon (DFCC), a well run, reputable DFI, to create and manage an Administrative Unit (AU) for the ESD Credit Program. In addition to record keeping and

periodic reporting, the AU (acting for the GOSL) will process disbursement requests for subloans and GEF grant funds approved by PCIs under their free limit and those requests above the free limit approved by IDA. The AU will also undertake off-grid subproject support activities. The role and responsibilities of the AU are detailed in TORs in the project file. Although the DFCC has not previously administered an IDA Credit program, it is familiar with IDA's procedures and has assigned a competent manager to head the AU whose staffing arrangement appears adequate. The DFCC senior management has given assurances that all necessary measures will be taken for smooth operation of the AU.

- **CEB - Pilot Wind Farm and Capacity Building:** The CEB has adequate experience under previous IDA projects in implementing similar project components. To avoid procurement delay problems similar to those in the ongoing Second Power Distribution and Transmission Project, the CEB has agreed to an accelerated schedule for Pilot Wind Farm procurement, including release of the EPC bid package by ESD Project Negotiations. The Pilot Grid-Connected Wind Farm would allow the CEB to address grid integration issues, demonstrate commercial viability, and prepare for anticipated subsequent private sector wind farm development. Even if the CEB is restructured under the proposed Power Sector Restructuring Project, the experience gained through the Pilot Wind Farm and Capacity Building components will be transferable to the new utility entities. The Pilot Wind Farm and Capacity Building components will be supervised by the Additional General Manager (Planning) (AGM). The above arrangements are satisfactory, especially since agreement has already been reached on the major issue, which is beyond the control of the AGM (procurement of the Pilot Wind Farm).

#### 17. Social Assessment:

Project preparation included extensive consultation with local NGOs and as well as public and private sector stakeholders. The proposed project would have a positive social impact by providing initial electrification services to up to 32,000 rural households currently without access to grid service.

Women and children are expected to benefit the most from these off-grid services. The improved lighting will allow time to undertake additional income generating activities. Women also note that better lighting enables them to respond more quickly to infant needs at night. Children benefit from the additional time to study, watch television or listen to the radio.

#### 18. Environmental Assessment:

Environmental Category

☐ A ☒ B ☐ C

The proposed project would yield net positive environmental effects. The off-grid electrification sub-projects would reduce use of kerosene and lead-acid automotive batteries, thus benefiting the environment. No significant negative impacts are envisaged from the run-of-river village-hydro projects, as demonstrated by the 20 existing village hydro projects. Because of their small size and the fact that civil works are already in place, the grid-connected tea estate mini-hydro sub-projects are also unlikely to cause significant environmental damage. No resettlement is envisioned because the Project does not involve land acquisition. Power generated from renewable energy sources or saved through DSM would correspondingly reduce emissions from fossil fuel burning, with benefits to the local and global environment. The PCIs would ensure that project sponsors obtain GOSL and IDA-mandated environmental clearances, where necessary. Mini-hydro subprojects will be reviewed by the Central Environment Authority. An environmental review for the Pilot Wind Farm has confirmed that it will have minimal environmental impacts, entail no relocation of local population and would be located more than one mile outside the Bundala and Yala wildlife reserves.

#### 19. Participatory Approach:

	<u>Identification/Preparation</u>	<u>Implementation</u>	<u>Operation</u>
Private Sector Subproject developers	IS/CON/	IS/CON/COL	IS/CON/COL
NGOs - Sarvodaya, SoLanka, ITDG	IS/CON/COL	IS/CON/COL	IS/CON/COL
Local Financial Institutions	IS/CON	IS/CON/COL	IS/CON/COL
UNDP	IS/CON/COL	IS/CON/COL	IS/CON/COL

[Information sharing (IS); consultation (CON); and collaboration(COL).]

Project identification/preparation included extensive collaboration with private sector, NGO, local financial institution, and donor stakeholders:

**Private Sector** - The Project has been prepared at the request and in consultation with the beneficiaries, many of whom are in the private sector. Mini-hydro project developers in particular, have met frequently with the project preparation team to assess progress and offer advice. They have made very clear their interest in accessing the ESD Credit Program.

**NGOs** - Sri Lankan NGOs active in renewable energy, including Sri Lanka's two largest NGOs, Sarvodaya and Sanasa, as well as several others more directly focused on energy issues, have been key participants in project preparation: (i) Sarvodaya has undertaken the PPF-funded solar home system pilot project of 300 systems, and plans to expand this effort to at least 5,000 systems under the ESD Credit Program; (ii) SoLanka, an NGO which focuses on provision of solar home systems, has advised on issues in this area; (iii) the Intermediate Technology Development Group (ITDG), has supported early development of village hydro in Sri Lanka, installed the first 20 systems with donor support, and provided consultant assistance to the PPF-funded Pathavita Village Hydro pilot project; (iv) the Energy Forum, a consultative group including these and other NGOs, as well as CEB, academic, and private sector parties interested in promotion of renewable energy in Sri Lanka, coordinated comments on ESD Project design as well as specifications for village hydro and solar home systems; and (v) Sanasa, has expressed interest in a solar home system project. These groups are expected to take an active role in ESD Project implementation and operation.

**Local Financial Institutions** - Development finance institutions as well as private banks have enthusiastically participated in project preparation, offering suggestions based on experience with previous SMI projects as well as the ongoing Private Finance Development Project. These financial institutions requested that the Project include retroactive financing, so they could begin project development immediately.

**Donors** - Project preparation included extensive collaboration with UNDP to ensure full complementarity between the IDA/GEF Energy Services Delivery Project, and the UNDP/GEF Renewable Energy and Energy Efficiency Capacity Building Project. Collaboration with additional donors, in particular GTZ, is anticipated during project implementation and operation.

## 20. Sustainability:

The sustainability of the **mini-hydro** subprojects, under the ESD Credit Program (mainly rehabilitation of existing tea estate mini-hydro sites), would be provided by an enabling regulatory environment, strengthened institutions, and appropriate incentives for stakeholders. These include a standardized power purchase agreement, tariff, and interconnect specifications for small private power producers. The project would also strengthen CEB's planning capacity, support the growth of a commercial infrastructure, strengthen the capabilities of the banking sector in lending for alternative energy projects, and use local institutions to deliver energy services. Financial participation from stakeholders and the establishment and enforcement of technical standards would also contribute to the long term sustainability of mini-hydro sub-projects which would not receive any GEF grants.

The sustainability of the GEF-supported **solar home system, village hydro and Pilot Wind Farm** subprojects would be ensured by: (a) technical performance, and (b) financial performance after the GEF grant ends. Pilot projects will help demonstrate the affordability of commercial off-grid solar home system, and village hydro services.

Building on Sri Lanka's extensive experience with solar home systems to date, the Project will foster technical sustainability by: (i) requiring that equipment meets appropriate technical specifications; (ii) spot-checking installed systems; (iii) requiring the project sponsors to develop credible after-sales service as well as overall consumer protection plans as a condition of participation; and (iv) providing a consumer education and protection service in the AU for complaint follow-up, with a provision that poor quality service would jeopardize the sponsors' participation in the ESD project. Financial sustainability will be based on full cost recovery through private sector firms or NGOs and cost reductions achieved over the course of the project. These are expected from economies of scale and learning curve cost reductions mainly in the delivery and financing mechanisms, i.e., in transaction costs and perceived risks associated with the creation by the private sector of a rural sales and service network. Some cost reductions are also envisioned in locally manufactured components, such as battery controllers. The continued decline in international prices for photovoltaic

modules will also contribute to cost reductions. It is expected that future prices will be significantly below Sri Lanka's relatively high current prices, even allowing for some cost increase after the GEF grant ends.

Sri Lanka also has excellent experience in the operation of village hydro systems. The lessons of this experience will be applied to the operations supported by the ESD project. Subprojects will be subject to appropriate technical specifications, developed with Bank assistance. Project sponsors will be required to develop credible servicing plans. As with solar home systems, cost reductions are expected over the course of the project, through economies of scale and learning curve cost reductions, so that future projects would be more economical. For the pilot wind farm, the technical sustainability will be the responsibility of the CEB, with technical assistance provided through IDA support. It is expected that the wind farm performance would encourage local manufacture of some components (i.e. towers, electronics, etc.) bringing installed system prices closer to the lower prices already prevailing elsewhere such as in southern India. This would also lead to economic sustainability and replicability.

The sustainability of demand-side management activities will be achieved through demonstration of financial benefits achieved through energy savings. A voluntary Code of Practice for Energy Efficient Commercial Buildings is an essential first step for future GOSL energy efficiency initiatives. The Code of Practice for Energy Efficient Commercial Buildings, together with a Load Research Program to better identify customer energy consumption patterns and trends will be used to educate the private sector, building and engineering communities and promote energy efficient behavior. A pilot design competition for new buildings will be used to heighten awareness, demonstrate benefits of energy efficiency and encourage compliance with the Code of Practice.

## 21. Critical Risks\*:

	<u>Risk</u>	<u>Risk Rating</u>	<u>Risk Minimization Measure</u>
<b>Generic Risks</b> (e.g., macroeconomic risks, past country portfolio failure rate based on OED project ratings, etc.)	Interest rates may increase due to macro-economic conditions, this could constrain investments in renewable energy	Moderate	GOSL in dialog with IMF on a potential Extended Structural Adjustment Facility (ESAF) which includes fiscal controls
<b>Project-Specific Risks</b>	Private sector interest in renewable energy may decline	Low	<ul style="list-style-type: none"> <li>i) Strong private sector interest was a major impetus to ESD Project development;</li> <li>ii) A Standard Power Purchase Agreement and Tariff to be adopted by CEB by Negotiations;</li> <li>iii) Grant support is available from the GEF for off-grid subproject preparation;</li> <li>iv) Retroactive financing, requested during appraisal by prospective PCIs and developers, is available to encourage early preparation of off-grid subprojects;</li> </ul>

Project-Specific Risks (Cont.)	Interest of PCIs in financing renewable energy may wane	Low - Moderate	<ul style="list-style-type: none"> <li>v) Market assessments indicate strong potential demand</li> <li>vi) The capacity building component aims at strengthening local alternative energy expertise</li> <li>vii) The complementary UNDP/GEF project supports a broader capacity building effort</li> </ul>
	CEB (or possible new restructured utility entities) may not maintain commitment to private power and timely revision of small power purchase tariff	Low	<ul style="list-style-type: none"> <li>i) Long-term sustainability of off-grid subprojects will be fostered by AU Consumer Education and Protection Services and by adherence to technical standards, resulting in high quality products.</li> <li>ii) Mini-hydros can be highly profitable, PCI interest likely to be sustained.</li> </ul>
	Public/private sector cooperation in DSM may falter	Moderate	GOSL/Bank power sector dialogue continues to stress private sector participation.
	Power outages (resulting in reduced power sales by private developers) may cause financial hardship	Moderate	TA to DSM Unit aims at promoting the public/private sector links.
	Wind power development proves sufficiently attractive for future private sector development	Low	<ul style="list-style-type: none"> <li>i) Many mini-hydro plants will gain the bulk of their revenue from power sales to co-located tea estates. These sales should not be affected by power cuts.</li> <li>ii) CEB will issue semi-annual reports on the Pilot Wind Farm to keep the private sector informed of progress as well as CEB's assessment of future wind power development.</li> <li>iii) Private sector has already begun investigation of wind power development.</li> </ul>
	Drought or low-wind conditions could reduce financial viability of renewable energy subprojects	Low	Subproject technical designs and business plans, appraised by PCIs, must account for abnormal weather conditions
Overall project risk rating		Low	

## 22. Possible Controversial Aspects:

CEB's labor union has expressed strong opposition towards privatization of energy services delivery, specifically private development of large power facilities. In this regard, however, the small size (under 5 MW) of the mini-hydro plants, envisioned under the ESD Credit Program, are not expected to generate controversy.

## Block 4: Main Loan Conditions

### 23. Effectiveness Conditions:

- (a) Signing of subsidiary Loan Agreement (acceptable to IDA) between the GOSL and the CEB;
- (b) Signing of a Project Administration Agreement (acceptable to IDA) between the GOSL and the DFCC for administrative and technical assistance functions for the ESD Credit program (including related GEF grant); and
- (c) Signing of Participation Agreements and Demonstration of Compliance with Conditions of Participation, satisfactory to IDA, between GOSL and at least two eligible PCIs.

### 24. Other:

#### Negotiation Conditions:

- (a) Approval by the CEB Board of a Standard Small Power Purchase Agreement for private power projects of up to 5 MW with an annexed Non-negotiable Tariff, and commitment to annual Tariff revision effective January 1 of each year;
- (b) CEB Board approval of its commitment to annual publication of the revised Tariff in a nationally circulated Sri Lankan newspaper and availability of the SPPA, including the Tariff Annex and Grid Interconnection Specifications; and
- (c) CEB's issuance of EPC Bidding documents for the Pilot Wind Farm.

#### Board Condition:

Selection of the EPC contractor for the Pilot Wind Farm

#### During negotiations, agreements would be sought on the following:

##### From the GOSL:

- (a) Mid-term project review
- (b) Project monitoring indicators
- (c) On-lending rate to the CEB for the Pilot Wind Farm and Capacity Building components of 14% for 17 years with 2 years grace

##### From the GOSL for the ESD Credit Program:

- (d) Operating policy guidelines and on-lending arrangements for IDA funds
- (e) Operating policy guidelines and grant release arrangements for GEF cofinancing and TA grants  
PCI eligibility criteria
- (f) Use of the Average Weighted Deposit Rate (AWDR) of interest-bearing deposits of all branches of domestic commercial banks as the initial on-lending reference rate to PCIs
- (g) Procedures for procurement, disbursement, subproject review, periodic reporting, accounting, and auditing
- (h) Earmarking of US\$5.0 million for off-grid subprojects until the Mid-Term Review
- (i) Solar Home System and Village Hydro technical specifications and certification requirements

##### From the CEB for the Pilot Wind Farm and Capacity Building Components:

- (j) Appointment of a Pilot Wind Farm Project Manager



- (k) Oversight arrangements for the Pilot Wind Farm and Capacity Building Components
- (l) Preparation of semi-annual reports concerning the Pilot Wind Farm performance to be made available to the private sector
- (m) Auditing and reporting procedures
- (n) Terms of reference for the Pre-electrification Unit
- (o) Terms of reference for the Demand Side Management Unit
- (p) IDA prior authorization of all goods, works, and services expenditures under the Pilot Wind Farm and Capacity Building components

### Block 5: Compliance with Bank Policies

- ☒ This project complies with all applicable Bank policies.
- ☐ [Management approved exceptions to the following Bank policies: \_\_\_\_\_]
- \_\_\_\_\_ The project complies with all other applicable Bank policies.]

[signature]

Task Manager: Loretta Schaefer

[signature]

Country Manager: Roberto Bentjerodt



# Annex 1

## Project Design Summary

Narrative Summary	Key Performance Indicators	Monitoring and Supervision	Critical Assumptions and Risks
<b>CAS Objective</b> 1. Enhance environmentally sustainable development 2. Promote private sector delivery of energy services	Continued compliance with National Environmental Action Plan (NEAP) power sector provisions	Continuing Bank dialogue on power sector restructuring	(CAS Objective to Bank Mission) GOSL commitment to power sector reform
<b>Project Development Objectives:</b> 1. Promote the provision by the private sector, NGOs and cooperatives of grid-connected and off-grid energy services using environmentally sustainable renewable energy technologies 2. Strengthen the environment for DSM implementation 3. Improved public and private sector performance to deliver energy services through renewable energy and DSM	1.1 installation of at least 26 MW of grid and off-grid renewable energy capacity by end of 2002 including service to 32,000 off-grid customers by end of project 1.2 at least one power purchase agreement for a private wind power project signed by CEB  2. CEB issuance of Energy Efficient Commercial Building Code of Practice (EECB)  3.1 CEB annual update of Small Power Purchase Tariff (SPPT) 3.2 Signing by CEB of a least 5 SPPA contracts by mid-term evaluation; 12 by Project completion 3.3 generation planning models prepared by CEB which incorporate intermittent, non-dispatchable renewable energy generating sources	1 DFCC/AU quarterly reports  2. CEB semi-annual reports  3.1 Annual newspaper announcement of SPPT by CEB 3.2 DFCC/AU quarterly reports	(Development Objectives to CAS Objective) 1. Private sector interest sustained  2. DSM public/private sector cooperation  3.1 CEB (or possible new restructured utility entities) maintain commitment to private power and timely revision of SPPT 3.2 PCI interest sustained
<b>Global Environment Objective:</b> 4. Mitigation of carbon emissions in Sri Lanka through displacement of fossil fuels by non-carbon emitting renewable energy technologies and DSM	Items 1.1 - 3.3 above	4.1 DFCC/AU quarterly reports. 4.2 CEB semi-Annual reports	Items 1-3.2 above
<b>Project Outputs</b> 1. Renewable energy subprojects  2. Pilot Wind Farm  3. Training and materials to enhance private, NGO, and public sector capability.	1.1 Standard Small Power Purchase Agreement (SPPA), non-negotiable power purchase Tariff in place 1.2 Installation of about 16 MW (about 15 subprojects) of grid and off-grid renewable energy capacity by end of project (7 MW by mid-term review)  2. Commissioning of a Pilot Wind Farm of about 3 MW by 5/98  3.1 At least 15 CEB staff/private sector developers/NGO staff trained to deliver energy services via renewable energy development by mid-term evaluation 3.2 A guide for practical implementation of	1. DFCC/AU quarterly reports  2. CEB semi-annual wind farm reports	<b>Outputs to Development Objectives)</b> 1.1 None with respect to SPPA and Power Purchase Tariff (these were conditions of negotiations) 1.2. Power cuts (resulting in reduced power sales by private developers) do not cause undue financial hardship  2. Wind power development attracts private sector investors

4. Code of Practice for Energy Efficiency in Commercial Buildings	4. Public review and completion of EECB Code (by Mid-Term Review and end of Project, respectively)														
5. Load Research Program	5.1 Review of draft Load Research program by Mid-Term Review; load research program start-up by end of Project 5.2 on premises load metering of at least 10 major consumers														
Project Components [See Annex 2 for a detailed description.]	Disbursement of IDA and GEF funds according to schedule: <table><tr><td></td><td>IDA (US\$m)</td><td>GEF (US\$m)</td></tr><tr><td>1</td><td>20.8</td><td>3.9</td></tr><tr><td>2</td><td>2.3</td><td>0.9</td></tr><tr><td>3</td><td>1.1</td><td>1.1</td></tr></table>		IDA (US\$m)	GEF (US\$m)	1	20.8	3.9	2	2.3	0.9	3	1.1	1.1		(Components to Outputs)
	IDA (US\$m)	GEF (US\$m)													
1	20.8	3.9													
2	2.3	0.9													
3	1.1	1.1													
1. ESD Credit Program		1. Verified through regular project monitoring	1.1 private sector interest and ability to prepare subprojects 1.2 active participation of PCIs 1.3 adequate operation of AU												
2. Pilot Wind Farm		2. Verified through regular project monitoring	2.1 effective CEB procurement and implementation 2.2 continued CEB focus on renewable energy and DSM during restructuring process												
3. Capacity Building in Renewable Energy and DSM		3. Verified through regular project monitoring	3 CEB focus on renewable energy and DSM during restructuring process												

## Annex 2

### Detailed Project Description

**Project Component 1 - Energy Services Delivery Credit Program - US\$47.7 million** (total cost of component)

#### Description

1. The ESD Credit Program would make funds available to Participating Credit Institutions (PCIs) to provide medium and long-term financing to private enterprises, NGOs and cooperatives for household solar photovoltaic (PV) and village-hydro off-grid electrification, grid-connected mini-hydro schemes and other renewable energy subprojects up to 5 MW.<sup>1</sup> US\$5.0 million of the Credit Program proceeds would be reserved for off-grid subprojects (e.g., solar home system and village-hydro schemes) until the Mid-Term Review of the Project, after which time reallocation of the reserved funds may be considered. An Administrative Unit (AU) to be established within the DFCC will administer the Component on behalf of the GOSL on a fee basis.
2. Grant cofinancing from the GEF would be made available through PCIs to developers of off-grid PV and village hydro subprojects. Grant funds will help subproject developers cover costs for consultant services to prepare feasibility studies, business plans and PCI loan documentation for off-grid subprojects. GEF funds will also be used for AU off-grid project promotional efforts as well as solar home system verification and implementation of a consumer education and protection service.
3. As of July 1996, a pipeline of mini-hydro, village hydro, and solar home system projects totaling over \$58.0 million in total project costs had been identified for potential financing through the Credit Program Component. Additional subprojects are likely to be forthcoming once the proposed IDA Credit is approved and potential PCIs sign Participation Agreements with the GOSL. The identified pipeline includes 37 potential grid-connected mini-hydro subprojects with capacities ranging from 250 kW to 4,665 kW. Collectively, these facilities would add approximately 35 MW to the CEB Grid. In addition, at least 30 villages are seeking assistance in preparing village-hydro subprojects (1.5 - 60 kW each). Four developers are preparing solar home system subprojects while two others have expressed interest.
4. Seven financial institutions have expressed strong interest in participating in the ESD Credit Program Component and have provided detailed financial data which confirm their ability to meet the agreed eligibility criteria for participation. Collectively these potential PCIs are comprised of domestic private commercial banks, development finance institutions (DFIs) and merchant banks. In addition a leasing company has expressed strong interest in participating, but intends to clarify tax implications before requesting to be considered as a potential PCI.
5. Given the large number of potential subprojects noted in paragraph 3 and the strong interest expressed by seven potential PCIs, there is reasonable certainty that the proposed IDA credit and GEF grant amounts (IDA \$19.7 million, GEF \$3.7 million) could be committed within three years following credit effectiveness.

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<sup>1</sup> Larger projects could seek financing via the Private Sector Infrastructure Development (PSID) Project.

## On-lending Arrangements

6. On-lending arrangements and operating policy guidelines for the ESD Credit Program are patterned after those used in the ongoing Private Finance Development Project (PFDP - Cr. 2484-CE). For subprojects below their free-limit (and except for certain projects discussed in paragraph 7), PCIs will submit refinancing applications directly to the AU. IDA prior project approval is not required, although PCIs are responsible for maintaining subproject documentation on file including the PCIs assessment of creditworthiness of the subborrower, brief description of project and procurement methods, and list of goods and services to be financed (for a complete list of documentation see page 8 of this annex). All reimbursement applications shall be submitted directly to the AU and shall include a summary description of the subproject and subproject developer, and the terms and conditions of the subloan. Reimbursement requests will be paid to the applicant PCIs from a Special Account in the Central Bank of Sri Lanka (CBSL), which the AU will operate.

7. For (i) each PCI's first two subloans (irrespective of size), (ii) all subloan proposals for solar home systems projects, and (iii) loans in excess of their free limit, PCIs will send subproject proposals directly to IDA for subloan reviews. In addition to the documentation required for projects below free-limits, subproject proposals to IDA shall include appraisal of the subproject, cash flow projections for subborrower and the project, assessment of technical and commercial feasibility, and financial and economic justification for the project (see page 8 of this Annex). In addition all reimbursement requests for such projects shall be submitted directly to IDA. Reimbursement requests shall include a summary description of the subproject and subproject developer as well as the terms and conditions of the subloan, and will be paid to the applicant PCIs from a Special Account in the Central Bank of Sri Lanka (CBSL), which the AU will operate.

## On-lending Terms and Conditions

8. **GOSL to PCIs:** The proceeds of the Credit Program Component would be onlent to PCIs in rupees (i.e., GOSL will bear all foreign exchange risk) for a term equivalent to a composite amortization schedule with a maximum of 15 years, including a maximum of 5 years grace. The onlending rate to PCIs will be a variable interest rate equal to the Average Weighted Deposit Rate (AWDR) of all interest-bearing deposits of all branches of domestic commercial banks, or another appropriate rate to be determined during project implementation by GOSL in consultation with IDA. The interest rate for new and existing loans would be subject to revision every 6 months. Refinancing for each subproject will be limited to US\$ 3.0 million or the single borrower exposure limit of concerned PCI (whichever is lower) as well as 60% of the total PCI subloan amount.

9. **PCIs to Sub-Borrowers:** PCIs will be free to set their lending rate in agreement with their clients. Subloan maturities will be limited to 10 years, including a maximum 2 year grace, and not to exceed the useful economic life of the equipment financed.

## Disbursement

10. The Credit Component will have a 5-year disbursement period as indicated on page 1 of the Project Appraisal Document. IDA will reimburse the PCIs for 60% of eligible subloan expenditures. Reimbursement is available for project-related expenditures made within 120 days prior to receipt of the reimbursement application and supporting subproject documentation. For expenditures below the free limit, PCIs will submit reimbursement applications and full documentation directly to the AU who will ascertain the eligibility of the expenditures and notify the CBSL to make payments from the Special Account to the PCI for eligible expenditures. For

expenditures above PCIs free limits, the AU will submit reimbursement applications to IDA for review/approval.

**Operating Guidelines** (see pages 6 -11 of this Annex for a Table of Operating Guidelines)

11. **PCI Eligibility:** Under PFDP only private commercial banks and development finance institutions (DFIs) which meet specific eligibility criteria have been allowed to participate. These are: the NDB, DFCC, Hatton, Sampath, CBOC, and Seylan Banks. The ESD Credit Program would adopt the PFDP eligibility criteria (see Project Files and Annex 5) for DFIs and commercial banks. The six PCIs under PFDP, all of which have expressed interest in the ESD Credit program, would be eligible in principle by virtue of their continued compliance with PFDP eligibility criteria. PCI eligibility criteria also have been prepared for merchant banks, leasing companies, and NGOs (see Project Files). Candidate institutions would be able to apply for PCI status at any time during the ESD Credit Program commitment period. Assessment of eligibility of the potential PCIs for the ESD Credit Program will be given in the Project Files. *A condition of effectiveness will be the signing by at least two PCIs, of a Participation Agreement with the GOSL (satisfactory to IDA).* The Agreement will include a clause that the PCI will at all times comply with the eligibility criteria and maintain the minimum ratios as shown therein.

12. **Eligible Subprojects:** Eligible subprojects include investments by private enterprises, NGOs, and cooperatives for grid-connected mini-hydro facilities (not to exceed 5 MW in generating capacity), off-grid village hydro schemes which comply with the current Village Hydro Technical Specifications on file at the AU, solar home systems project which comply with the current Specifications for Solar Home Systems , and other renewable energy investments.

13. **Subloan Applicant Eligibility Criteria:** Eligible subloan applicants include any private enterprise, NGO and cooperative operating in Sri Lanka, subject to PCIs credit-worthiness assessment.

**GEF Grants**

14. **Cofinancing of Off-Grid Subprojects:** Grant cofinancing would be made available through PCIs to developers of off-grid PV solar home system and village-hydro projects. Grant financing will be limited to \$400 per kW of installed village hydro capacity, up to US\$20,000, and \$100 per PV solar home system with a module rating not less than 30 W. For PV solar home systems, beneficiaries will submit installation certificates to the AU through their PCI. The AU will subsequently release grant funds to the PCI subject to, inter alia, verification that the module has not previously received Grant cofinancing (see the Project File for the complete Terms of Reference for the AU). Similarly, the AU will release grant cofinancing of village-hydro schemes subject to certification by a Chartered Engineer that the facility is complete, operational, and in compliance with IDA-approved Specifications for Village-Hydro Schemes.

15. **Subproject Preparation Grants:** In addition to cofinancing of off-grid subprojects, grant funds will be available to subproject developers to help prepare feasibility studies, business plans and PCI loan documentation for off-grid subprojects. Up to 90% of the preparation costs for a solar home system subproject (up to \$6,500) and 95% of the preparation costs for a village-hydro subproject (with a \$9,500 ceiling) can be reimbursed. The preparation grants *cover only independent consulting services directly attributable to subproject preparation.* The cost of off-grid project developers' direct project preparation efforts are ineligible for compensation. Reimbursement would require off-grid subproject developers to submit the following documentation to the AU through their PCI: (i) PCI approval of the subproject on the basis of a completed feasibility study/business plan/bank loan application package, (ii) presentation of

eligible expenses, and (iii) a disbursement request. Off-grid project preparation activities previously paid for by GEF and/or IDA are not eligible for subproject preparation grants.

16. Off-Grid Project Support: GEF funds will also be channeled to the AU for the following off-grid support activities:

- Off-Grid Project Promotion: A promotional effort will be carried out by the AU to increase awareness among potential customers regarding energy service delivery through village hydro and solar home systems.
- Solar Home System Design Verification: GEF Grant funds will be available to PCIs for hiring consultants to verify that solar home system designs meet IDA-approved specifications and that systems are installed properly (as required for GEF Grant cofinancing and IDA refinancing, respectively).
- Consumer Education and Protection Facility: A Facility will be maintained and publicized by the AU for investigating unresolved consumer complaints against dealers and seeking appropriate solutions.

#### **Responsibilities of AU**

17. An Administrative Unit (AU) established within the DFCC will administer the Component on behalf of the GOSL on a fee basis. The Terms of Reference for the AU are presented in the Project File. The AU's responsibilities will include:

- (a) Administration of the ESD Credit Program Component including processing refinancing applications and disbursement requests for loans approved by PCIs under their free-limit and those approved by IDA for loans exceeding PCIs' free-limits;
- (b) Administration of the GEF Grant Funds in Support of the ESD Credit Program Component including processing requests for disbursement of GEF Grant Financing; and
- (c) Off-Grid Project Support Activities, including:
  - Off-Grid Project Promotion - The AU will implement a promotional effort to increase awareness among potential customers regarding village hydro and solar home systems. This should include both promotional and educational messages regarding realistic expectations of system performance, other benefits, costs, lifetime, and warranties. The promotional effort should be aimed at enabling consumers to make informed purchase decisions. Details of the promotion campaign will be developed by the AU in close consultation with IDA.
  - Solar Home System Verification - The AU will maintain a list of consultants acceptable to IDA who are capable of verifying that the solar home system proposed in the subloan application meets the Specifications for Solar Home Systems (see Project Files). The AU will also administer TA funds for PCIs to retain consultants for this purpose. If a subborrower changes elements of the solar home system design during the course of the subproject, re-verification will be required. Such re-verification will not be eligible for TA funds. The AU also will administer TA funds for PCIs to retain consultants to verify serial numbers given on grant applications and to confirm on a sampling basis the compliance of installed systems with the PV Specifications. Upon receipt of a PCI report of

irregularities, the AU will follow up with remedial action. If the remedial action is unsuccessful and suspension from the Credit Program is required, the AU will notify all PCIs.

- **Consumer Education and Protection Facility** - The AU will maintain and publicize a Consumer Protection Facility. The Facility would investigate unresolved consumer complaints against dealers and seek appropriate resolution.

#### **Project Component 2 - Pilot Wind Farm - US\$3.7 million (total cost of component)**

18. The Pilot Wind Farm of approximately 3 MW would be executed by the CEB on an Engineer, Procure, and Construct (EPC) basis. The CEB would be responsible for monitoring, operation, and maintenance of the facility. The Pilot would be located in the Hambantota District. This region has sufficient wind resources to support up to 200 MW of commercial-scale wind farms. The Pilot Wind Farm would entail no relocation of local population and would be located well outside of the Bundala and Yala wildlife reserves. The size of the Pilot Wind Farm has been selected to (i) give CEB practical operational experience in grid integration issues for such intermittent generation sources; (ii) to demonstrate the viability of wind power in Sri Lanka; and (iii) to encourage subsequent private sector development of wind resources.

19. Prior to selecting the EPC contractor, the CEB will be responsible for finalizing wind farm site selection, and preparation and finalization of bid documents. Subsequent to signing the EPC contract, the CEB will ensure that the contractor implements the Pilot in a timely manner, and monitors its operation and performance. The CEB will also make available to private sector wind farm developers semi-annual reports concerning the technical, economic, and financial performance of Pilot Wind Farm.

20. **Onlending Rate:** The onlending rate to the CEB for the Pilot Wind Farm Component will be 14% with a 17 year maturity, including 2 years grace.

#### **Project Component 3 - Capacity Building - US\$2.5 million (total cost of component)**

21. **CEB Pre-Electrification Unit:** Capacity building to the CEB's PEU would broaden the Unit's expertise in off-grid project preparation. Funds would also enhance the PEU's ability to train staff from CEB, private sector, and non-governmental organizations. To this end, funds would be provided to the CEB's Pre-Electrification Unit to procure equipment as well as retain local consultants with expertise in technical, financial, institutional, or business matters related to renewable energy projects design and development. Consultants would:

- (a) develop and conduct training courses for CEB staff as well as private sector and NGO personnel; and
- (b) assist CEB staff in feasibility study preparation and other services related to off-grid project support.

22. **DSM Unit:** Capacity building to the CEB's DSM Unit would consist of:

- (a) design and implementation of a Code of Practice for Energy Efficient Commercial Buildings;

**Table A.1: Draft Outline of Operating Policy Guidelines for the ESD Credit Program**

<u>Measure</u>	<u>Arrangement/Entity</u>
<b>Loan Amount and Financing Sources</b>	Total: US\$23.4 million IDA: US\$19.7 million and GEF: US\$3.7 million
<b>Borrower</b>	Government of Sri Lanka (GOSL)
<b>Executing Agency</b>	Development Finance Corporation of Ceylon (DFCC) / Administrative Unit (AU)
<b>Estimated Commitment Period</b>	Three years after Credit Effectiveness
<b>Interest Rates</b>	
Service Charge to GOSL	Standard IDA Service Charge.
Interest Rate to Participating Credit Institutions (PCIs)	<ul style="list-style-type: none"> <li>o Average Weighted Deposit Rate (AWDR) of all interest-bearing deposits of domestic commercial banks, or another appropriate rate to be determined during project implementation by GOSL in consultation with IDA.</li> <li>o Rate subject to revision (both new and existing loans) every 6 months.</li> </ul>
Interest Rate from PCIs to Final Borrowers	To be determined by PCIs in agreement with their clients.
<b>Maturity Structure of Credit and Subloans</b>	
IDA to GOSL	Standard IDA terms with 40 years maturity
PCIs to GOSL	Composite amortization schedule (aggregated from the individual subloans) with a maximum of 15 years, including a maximum of 5 year grace.
Subloans	Maximum 10 years, including maximum 2 year grace. Maximum maturity not to exceed useful economic life of equipment financed.
Applicant Eligibility Criteria	Any private enterprises, NGOs and cooperatives operating in Sri Lanka are potentially eligible, subject to PCIs' creditworthiness assessment.
Eligible Subprojects	<ul style="list-style-type: none"> <li>o Private investment proposals for (a) grid-connected mini-hydro (with capacity not more than 5MW); (b) off-grid village hydro; (c) solar home systems; and (d) other renewable energy investments.</li> <li>o Funds cannot be used for financing of acquisition of existing assets (including land) or refinancing of existing debts.</li> </ul>
Maximum amount of rediscounting	Maximum US\$3.0 million for any one subproject, or single borrower exposure limit of concerned PCI, whichever is lower.
Portion of Subloan Rediscounted	Maximum 60% of PCI total loan amount for a specific subproject.
<b>Other Measures</b>	
Responsibility of Administration Unit (AU)	<ul style="list-style-type: none"> <li>o Process disbursement requests for loans approved by PCIs under their free limit and process disbursement requests for loans above PCIs free limit approved by IDA. Process disbursement requests for GEF grant co-financing.</li> <li>o With respect to subloans and GEF grant cofinancing, maintain disbursement records and accounts of each PCI, keep supporting disbursement documents, and keep bank accounts relating to disbursement. Maintain Project Accounts.</li> <li>o Inform IDA from time to time regarding the progress of the Project, provide regular reports on the progress of the Project, and assist IDA and GEF supervision and/or evaluation missions.</li> <li>o Maintain ESD Credit line-related statistical records.</li> <li>o Monitor timely preparation and submission of subproject completion reports.</li> </ul>



Responsibility of Administration Unit (AU) (Cont.)	<ul style="list-style-type: none"> <li>o Submit quarterly statistical reports on the ESD Project and other periodic reports (e.g., semi-annual collection performance report) as required by IDA and GEF.</li> <li>o Perform other tasks and functions as are necessary to achieve the objectives of the Project.</li> </ul>
Loan Approval Procedures	First two subloan proposals, irrespective of size, presented by any PCI, all subloan proposals for solar home systems, and subloans above the "free limit" are subject to prior approval by IDA.
Environmental Assessment Requirements	In accordance with national standards and procedures.
Subloan Documentation Requirements	<p>Subloans involving rediscounting below "free limit" (to be determined on the basis of experience of PCI in term lending).</p> <ul style="list-style-type: none"> <li>o PCI assessment of creditworthiness of subborrower;</li> <li>o Brief description of project and procurement methods;</li> <li>o List of goods and services to be financed;</li> <li>o Project costs and financing;</li> <li>o Terms and Conditions of subloans;</li> <li>o Timetable for implementation;</li> <li>o Evidence of environmental clearance; and</li> <li>o Economic justification for the project.</li> </ul> <p>Additional information for rediscounting more than "free limit:"</p> <ul style="list-style-type: none"> <li>o Description and Appraisal of the project;</li> <li>o Cash flow projections for subborrower and the project;</li> <li>o Assessment of technical and commercial feasibility; and</li> <li>o Financial and economic justification for the project.</li> </ul>
Procurement Procedures	<ul style="list-style-type: none"> <li>o Bid packages over US\$2.0 million for goods contract, US\$3.0 million for works contract and US\$5.0 million for turnkey contract subject to International Competitive Bidding requirements.</li> <li>o All non-ICB contracts subject to normal commercial practices (quotations from at least 3 suppliers in accordance with World Bank Guidelines). An opinion from an independent expert acceptable to IDA on the reasonableness of quoted prices if three quotations are not received. Import of second hand equipment subject to independent inspection as to conditions and the reasonableness of the price.</li> </ul>
Disbursement Procedures	<ul style="list-style-type: none"> <li>o Eligibility of expenditures below "PCI's free limit" subloan would be ascertained by AU and disbursements of expenditures for all subloans would be made on the basis of PCIs' submission of full documentation. Detailed documentation evidencing expenditures to be kept by AU for external audits and for review by World Bank missions.</li> <li>o Reimbursement available for project-related expenditures made within 120 days prior to World Bank receipt of subloan/subproject proposals together with corresponding subproject documentation.</li> <li>o AU would have the authority to notify the Central Bank of Sri Lanka (CBSL) to make payments from the Special Account to the PCI and would be responsible for keeping track of this Account.</li> </ul>
Audit Requirements	<ul style="list-style-type: none"> <li>o Annual external audit required of Project Account and Special Account, and separate opinion on Statement of Expenditures (SOEs).</li> <li>o AU will be responsible for maintaining disbursement documentation for PCIs.</li> <li>o Annual external audit required of PCIs' financial statements and its compliance with the eligibility criteria.</li> </ul>

Exchange Risk	GOSL would bear all foreign exchange risk.	
Assessment of Compliance with Prudential Regulations by PCIs	Supervision Department of Central Bank of Sri Lanka or other relevant regulatory agencies for each PCI would confirm that PCIs conform with prudential regulations, taking into account eligibility criteria.	
<b>GEF Grant Arrangements</b>	<b>Village Hydro</b>	<b>Solar Home System</b>
Basis and Amount of GEF Grant Cofinancing	\$400 per kW installed up to a maximum of \$20,000	\$100 per system with module of 30W or greater
Trigger for Release of Grant Cofinancing	Certification by a Chartered Engineer that system is complete, complies with Specifications, and is operational.	Presentation of Installation Certificate and confirmation of eligibility.
Grant Cofinancing Allocation Period	Subloan disbursement period	One year, beginning on the date of subloan approval (and annual anniversary dates if applicable)
Project Preparation Grant Amount	95% of Preparation Costs up to \$9,000	90% of Preparation Costs up to \$6,500
Preparation Grant Eligible Expenses	Fees of an independent consultant directly attributable to subproject preparation. Only expenses incurred after September 1, 1996 would be eligible. Each subproject developer would be eligible for only one grant.	Fees of an independent consultant directly attributable to subproject preparation. Only expenses incurred after September 1, 1996 would be eligible. Each subproject developer would be eligible for only one grant.
Trigger for Project Preparation Grant Release	Presentation of eligible expenses and submission of disbursement request equal to or exceeding the GEF grant amount	Presentation of eligible expenses and submission of disbursement request equal to or exceeding the GEF grant amount
Off-Grid Project Promotion	GEF grant provided to AU to cover off-grid project promotion costs.	GEF grant provided to AU to cover off-grid project promotion costs.
Solar Home System Design Verification	n.a.	AU administers funds for PCI to hire consultant from list of qualified consultants maintained by AU.
Solar Home System Installation Verification	n.a.	AU administers funds for PCI to hire consultant.
Solar Home System Consumer Education and Protection Facility	n.a.	GEF grant provided to AU to cover costs of maintaining and publicizing a facility to investigate unresolved consumer complaints against dealers and to seek appropriate solutions.

**Annex 3**

**Estimated Project Costs (including contingencies)**

<b>Project Component</b>	<b>Local</b>	<b>Foreign</b>	<b>Total</b>
	<b>US\$ million</b>		
ESD Credit Program	20.6	28.3	48.9
Pilot Wind Farm	0.6	3.2	3.8
Capacity Building	1.6	2.0	2.6
<b>Total Project Cost</b>	<b>21.8</b>	<b>33.5</b>	<b>55.3</b>

**Financing Plan  
(US\$ million)**

<b>Component</b>	<b>Private Sector</b>					<b>Total</b>
	<b>IDA</b>	<b>GEF</b>	<b>PCIs</b>	<b>Entrepreneurs</b>	<b>CEB/GOSL</b>	
ESD Credit Program						
Estate Hydro	14.4	-	10.1	6.3	0.1	30.8
Village Hydro	0.3	0.1	0.1	0.1	0.1	0.7
Solar Home Systems	5.1	2.9	3.5	3.0	-	14.5
Business Development	-	0.3	-	0.2	-	0.5
Off-Grid Support	-	0.5	-	-	0.7	1.2
Subtotal	19.8	3.8	13.7	9.6	0.9	47.7
Wind Farm	2.2	0.8	-	-	0.6	3.6
Capacity Building						
PE Unit	-	0.3	-	-	0.2	0.5
DSM Unit	1.0	0.7	-	-	0.2	1.9
Subtotal	1.0	1.0	-	-	0.4	2.5
Unallocated	1.2	0.3				1.5
<b>Total</b>	<b>24.2</b>	<b>5.9</b>	<b>13.7</b>	<b>9.6</b>	<b>1.9</b>	<b>55.3</b>

Note: PPF of US\$0.34 million allocated to Credit Program (\$0.14 million); Wind Farm (\$0.1 million); PEU (\$0.02 million); and DSM Unit (\$0.08 million)

# Annex 4A

## Cost Benefit Analysis Summary Pilot (3 MW) Windfarm Component (US\$ Millions)

Table 4A.1 - Summary of Economic and Financial Analysis

	Present Value of Flows		Fiscal Impact	
	Economic Analysis	Financial Analysis <sup>1</sup>	Taxes	Subsidies
Benefits	2.8	4.5	-	-
Costs	2.9	3.6	-	-
Net Benefits: IRR:	11.9%	21.2%		

**Nature of Benefits:** The Pilot Wind Farm will give the Ceylon Electricity Board (CEB) practical operational experience in grid interconnection of wind power, and demonstrate the viability of wind power for electric power generation in Sri Lanka.

**Main Beneficiaries:** Ceylon Electricity Board and future private sector developers and investors.

**Main Assumptions:** See Tables 4A.2 through 4A.4 for a summary of the economic and financial analyses.

<sup>1</sup> Higher financial benefits primarily due to project financing.

WIND POWER CASE STUDY- Sri Lanka- Base Year 1996

12/17/96

Table 4A.2: Project Profile

Name:	Sn Lanka Pilot Windfarm					
Location:	Sn Lanka South Coast- Pilot					
Total Installation (kW)	2925.00					
Annual Production (GWh/a)	6.83					
Capacity Utilizing Factor (%)	26.7%					
Avoided Cost of Power (Rp/MWh)	3360.27					
Power Sales Price (Rp/MWh)	3360.27 (With VA Tax)					
Exchange rate (Rp/US\$)	53.00					
Interest rate of loan (%/a)	0.125					
Share of Loan	70%					
Term of Loan (Year)	20					
Grace Period	5 Yrs					
Depreciation Period:	3 Yrs					
Import Duty:	27%					
VAT on Imports	0%					
Capacity of the first year	100%					
Standard Conversion Factor	90%					
GEF Grant (\$US millions)	0.88					
Value added tax rate on output	0%					
Value added tax rate on input	0%					
VAA tax rate	0%					
Income tax rate	0%					
Standard Discount Rate	12%					
Inflation Rate:	1996	1997	1998	1999	2000	After 2000
	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Number of Turbines	13					
International Inflation	2.5%					
Turbine Cost (US\$/kwh including 10% towers)	1235					

Table 4A.3: Economic Cashflow with GEF Contribution of Rs.46.64 million

Year	Capital Cost	Operating Cost	Income	Net Benefit
1	141.04	0.00	0.00	-141.04
2		3.98	22.96	18.99
3		3.98	22.96	18.99
4		3.98	22.96	18.99
5		3.98	22.96	18.99
6		3.98	22.96	18.99
7		3.98	22.96	18.99
8		3.98	22.96	18.99
9		3.98	22.96	18.99
10		3.98	22.96	18.99
11		3.98	22.96	18.99
12		3.98	22.96	18.99
13		3.98	22.96	18.99
14		3.98	22.96	18.99
15		3.98	22.96	18.99
16		3.98	22.96	18.99
17		3.98	22.96	18.99
18		3.98	22.96	18.99
19		3.98	22.96	18.99
20	0.00	3.98	22.96	18.99
Total	141.04	75.57	436.29	219.68
NPV	125.93	26.16	151.02	-1.07
IRR				11.9%

**Table 4A.4: Financial Cash Flow With GEF Contribution, Inflation, Debt Financing, Income Tax (10<sup>6</sup> Current Rp)**

Year	Investment			Operating Cost	Total Cost	Gross Income	VAF/VAA Tax	Income Tax	Net Benefit
	Equity	Loan Principal	Loan Interest						
1	59.37	0.00			59.37			0.00	-59.37
2		0.00		4.61	4.61	25.32	0.00	0.00	20.70
3		0.00		4.84	4.84	26.58	0.00	0.00	21.74
4		0.00		5.09	5.09	27.91	0.00	0.00	22.83
5		0.00		5.34	5.34	29.31	0.00	0.00	23.97
6		10.87	20.38	5.61	36.86	30.77	0.00	0.00	-6.08
7		10.87	19.02	5.89	35.78	32.31	0.00	0.00	-3.47
8		10.87	17.66	6.18	34.71	33.93	0.00	0.00	-0.79
9		10.87	16.30	6.49	33.66	35.62	0.00	0.00	1.96
10		10.87	14.95	6.82	32.63	25.32	0.00	0.00	-7.31
11		10.87	13.59	7.16	31.61	37.40	0.00	0.00	5.79
12		10.87	12.23	7.51	30.61	25.32	0.00	0.00	-5.30
13		10.87	10.87	7.89	29.63	39.27	0.00	0.00	9.65
14		10.87	9.51	8.29	28.66	41.24	0.00	0.00	12.57
15		10.87	8.15	8.70	27.72	43.30	0.00	0.00	15.58
16		10.87	6.79	9.13	26.80	45.46	0.00	0.00	18.67
17		10.87	5.43	9.59	25.89	47.74	0.00	0.00	21.84
18		10.87	4.08	10.07	25.02	50.12	0.00	0.00	25.11
19		10.87	2.72	10.57	24.16	52.63	0.00	0.00	28.47
20		10.87	1.36	11.10	23.33	55.26	0.00	0.00	31.93
<b>Total</b>	<b>59.37</b>	<b>163.04</b>	<b>163.04</b>	<b>140.89</b>	<b>526.34</b>	<b>704.82</b>	<b>0.00</b>	<b>0.00</b>	<b>178.48</b>
<b>NPV</b>	<b>53.01</b>	<b>42.01</b>	<b>92.72</b>	<b>46.57</b>	<b>189.21</b>	<b>239.35</b>	<b>0.00</b>	<b>0.00</b>	<b>24.49</b>
<b>IRR</b>									<b>21.2%</b>

## Annex 4B

### Cost Benefit Analysis Energy Services Delivery (ESD) Credit Program Component<sup>1</sup> Solar Home Systems Representative Sub-Project (US\$ Thousands)

Table 4B.1 - Summary of Economic and Financial Analysis

	Present Value of Flows		Fiscal Impact	
	Economic Analysis	Financial Analysis	Taxes	Subsidies
Benefits	1,343	1,405	-	-
Costs	1,338	1,245	- <sup>2</sup>	-
Net Benefits: IRR:	12%	20%		

#### **Nature of Benefits:**

- a) **Benefits to the economy:** (i) Reduction in kerosene and battery usage; (ii) Demonstration of a commercially viable private sector/NGO executed off-grid electrification initiative; (iii) Mobilization of investment from private investors, village cooperatives and NGO enterprises at the village grassroots level; (iv) Reduced government investment in rural electrification through subsidized grid-electrification; (v) Protection of environment by avoided use of fossil fuels.
- b) **Benefits to Consumers:** Access to clean and better quality electricity service to 5,000 rural households currently without electric power. (Additional consumer benefits from improved quality of service are not included in the analysis.)

**Main Beneficiaries:** a) This NGO-supported subproject would serve 2,200 medium income rural households in the Galle district providing pre-electrification services; ESD Credit Program support of solar home system subprojects would have the following additional beneficiaries b) Private investors /NGOs at the village grassroots level; c) Local private sector entrepreneurs.

#### **Main Assumptions:**

- a) **Ability to pay:** Target households income per month exceed Rs. 3,000 and meet the affordability criteria.
- b) **GEF grant:** Grant cofinancing of \$100 per solar home system.

<sup>1</sup> This analysis is for one representative Solar Home System subproject. The ESD Credit Line is expected to support several such projects which, cumulatively, would install 30,000 systems.

<sup>2</sup> The NGO project sponsor for this case study is tax exempt.

**c) Economic Assumptions:**

(i) Discount rate: 12%; (ii) Exchange rate: Rs. 53/US\$; (iii) Currency/US\$; 1996 prices.

**d) Market Share:** 30 Watt system: 30%; 40Watt system: 42%; and 50 Watt system: 30%.

**e) Benefits:** Avoided expenditures on kerosene for lighting and on automotive battery charging for television, radio, etc. Additional consumer benefits of convenience, improved safety, better indoor air quality, and higher quality of light were not included due to a lack of adequate valuation data.

**f) See Tables 4B.2 through 4B.4 for summary economic analyses of 50 Watt, 40 Watt, and 30 Watt solar home systems, and Table 4B.5 for a summary of the financial analysis of the representative solar home system subproject.**



Table 4B.2: Economic Cashflow (Constant 1996 Rp)

**50 Watt Solar Home System**

12/17/96

	Cost	Life (years)	Life Cycle Cost
<b>First Cost</b>	<b>32,300</b>	<b>15</b>	<b>32,300</b>
Panels	15,600	20	-
Battery	3,300	3	5,833
Controller	3,120	7	1,939
Wiring, Switches & Outlets	1,820	15	-
Support Structure	1,040	15	-
Other Accessories	520	15	-
Bulbs	50	1	1,045
Fixture	450	10	818
Present Value -- Replacement			9,634
Present Value			41,934
Levelized Monthly			503
O&M -- Water, etc.			13
Present Value O&M			1,083
GEF Grant			5,300
<b>Solar 15 Year Net Present Value at 12%</b>			<b>37,718</b>

**Kerosene and Battery**

<b>Lighting</b>			
Kerosene Monthly Use (liters)	12		
Kerosene Cost \$/liter	12		
Monthly Kerosene Cost			144
Petromax Cost \$	1,040		
Petromax Life	5	years	
Petromax Levelized Cost	23		
Mantle Monthly	4		
Petromax Monthly			27
Wick lantern Cost	104		
Wick Lantern Life	3	years	
Number of Wick Lanterns	3		
Wick Lantern Levelized Cost	10		
Wicks used monthly	8		
Wick Lantern Monthly			19
Total Lighting Monthly			189
<b>Battery Costs</b>			
Charges Per Year	40		
Cost per charge	40		
Monthly Charging Cost			133
Battery Cost	2,500		
Lifetime	2	years	
Battery levelized Cost			118
Total Battery Monthly			251
<b>Kerosene/Battery 15 Year Net Present Value at 12%</b>			<b>36,704</b>
IRR			11%

Table 4B.3: Economic Cashflow (Constant 1996 Rp)

**40 Watt Solar Home System**

12/17/96

	Cost	Life (years)	Life Cycle Cost
First Cost	28,820	15	28,820
Panels	13,000	20	-
Battery	3,300	3	5,833
Controller	3,000	7	1,864
Wiring, Switches & Outlets	1,820	15	
Support Structure	1,040	15	
Other Accessories	520	15	
Bulbs	50	1	871
Fixture	450	10	682
Present Value -- Replacement			9,249
Present Value			38,069
Levelized Monthly			457
O&M -- Water, etc.			13
Present Value O&M			1,083
GEF Grant			5,300
<b>Solar 15 Year Net Present Value at 12%</b>			<b>33,853</b>

**Kerosene and Battery**

<b>Lighting</b>			
Kerosene Monthly Use (liters)	12		
Kerosene Cost \$/liter	12		
Monthly Kerosene Cost			144
Petromax Cost \$	1,040		
Petromax Life	5	years	
Petromax Levelized Cost	23		
Mantle Monthly	4		
Petromax Monthly			27
Wick lantern Cost	104		
Wick Lantern Life	3	years	
Number of Wick Lanterns	3		
Wick Lantern Levelized Cost	10		
Wicks used monthly	8		
Wick Lantern Monthly			19
<b>Total Lighting Monthly</b>			<b>189</b>
<b>Battery Costs</b>			
Charges Per Year	32		
Cost per charge	40		
Monthly Charging Cost			107
Battery Cost	2,500		
Lifetime	2	years	
Battery levelized Cost			118
<b>Total Battery Monthly</b>			<b>224</b>
<b>Kerosene/Battery 15 Year Net Present Value at 12%</b>			<b>34,482</b>
<b>IRR</b>			<b>13%</b>

Table 4B.4: Economic Cashflow (Constant 1996 Rp)  
12/17/96  
30 Watt Solar Home System

	Cost	Life (years)	Life Cycle Cost
First Cost	22,650	15	22,650
Panels	11,440	20	
Battery	2,250	3	3,977
Controller	1,500	7	932
Wiring, Switches & Outlets	1,300	15	-
Support Structure	780	15	-
Other Accessories	520	15	-
Bulbs	50	1	697
Fixture	450	10	545
Present Value – Replacement			6,151
Present Value			28,801
Levelized Monthly			346
O&M – Water, etc.			13
Present Value O&M			1,083
GEF Grant			5,300
<b>Solar 15 Year Net Present Value at 12%</b>			<b>24,584</b>

#### Kerosene and Battery

<b>Lighting</b>			
Kerosene Monthly Use (liters)	9		
Kerosene Cost \$/liter	12		
Monthly Kerosene Cost			108
Petromax Cost \$	1,040		
Petromax Life	5	years	
Petromax Levelized Cost	23		
Mantle Monthly	4		
Petromax Monthly			27
Wick lantern Cost	104		
Wick Lantern Life	3	years	
Number of Wick Lanterns	3		
Wick Lantern Levelized Cost	10		
Wicks used monthly	8		
Wick Lantern Monthly			19
<b>Total Lighting Monthly</b>			<b>154</b>
<b>Battery Costs</b>			
Charges Per Year	22		
Cost per charge	40		
Monthly Charging Cost			73
Battery Cost	2,250		
Lifetime	2	years	
Battery levelized Cost			106
<b>Total Battery Monthly</b>			<b>179</b>
<b>Kerosene/Battery 15 Year Net Present Value at 12%</b>			<b>25,137</b>
<b>IRR</b>			<b>13%</b>

Table 4B.5 Projected Cash Flow Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Cash In Flows</b>										
Equity Capital	2,000,000	500,000	500,000	500,000	500,000					
Initial Down Payment	1,756,560	2,342,080	2,927,600	2,927,600	2,927,600	0	0	0	0	0
GEF Grant	1,650,000	2,200,000	2,750,000	2,750,000	2,750,000	0	0	0	0	0
Long Term Bank Loan	4,000,000	5,900,000	4,800,000	2,700,000	2,900,000	0	0	0	0	0
Installment Received	264,810	1,056,958	2,361,401	4,217,912	6,595,603	7,855,171	7,063,023	5,758,580	3,902,070	1,524,378
Interest Income	585,734	1,932,835	3,386,218	4,622,597	5,337,795	4,902,997	3,555,897	2,102,514	866,135	150,937
Other Income	24,555	35,000	53,156	72,720	113,756	497,004	1,160,832	1,692,436	2,156,249	
Total Cash In Flows	10,281,660	13,966,873	16,778,376	17,790,828	21,124,754	13,255,173	11,779,752	9,553,530	6,924,454	1,675,315
<b>Cash Out Flows</b>										
Fixed Assets	200,000	1,030,000								
Increase in Stocks	1,247,700	415,900	415,900	0	0	0	0	0	0	0
Loan Interest	360,000	1,251,000	2,214,000	2,817,000	2,909,250	2,438,550	1,654,650	870,750	291,600	52,200
Loan Installments	0	0	0	800,000	3,775,000	4,355,000	4,355,000	4,355,000	2,080,000	580,000
Total Direct Costs	7,876,200	10,617,400	13,328,000	13,303,000	13,303,000	326,000	316,000	306,000	301,000	296,000
Total Fixed Overheads	271,000	484,800	688,500	688,500	688,500	688,500	688,500	608,850	529,200	449,550
Total Cash for Expenses	137,875	7,083	13,333	0	0	0	0	0	0	0
Total Cash Out Flows	10,092,775	13,806,183	16,659,733	17,608,500	20,675,750	7,808,050	7,014,150	6,140,600	3,201,800	1,377,750
Net Cash In/Out Flow	188,885	160,690	118,643	182,328	449,004	5,447,123	4,765,602	3,412,930	3,722,654	297,565
Cumulative Cash In/Out Flow	188,885	349,574	468,217	650,545	1,099,550	6,546,673	11,312,275	14,725,205	18,447,858	18,745,424
IRR	20.4042									

# Annex 4C

## Cost Benefit Analysis Energy Service Delivery (ESD) Credit Program Component Village Hydro Representative Sub-Project<sup>3</sup> (\$US)

Table 4C.1 - Summary of Economic and Financial Analysis

	Present Value of Flows		Fiscal Impact	
	Economic Analysis	Financial Analysis	Taxes	Subsidies
Benefits	15,471	24,332		
Costs	16,037	24,385	3,180	
Net Benefits:				
IRR:	11.8%	11.9%		

**Nature of Benefits:** (a) Demonstration of a commercially viable private sector village cooperative executed off-grid electrification initiative; (b) Access to clean and better quality electricity service to about 100 unelectrified rural households; (c) Mobilization of investment from private investors, village cooperatives and NGOs at the village grassroots level; (d) Positive environmental benefits from carbon displacement by avoided use of fossil fuels and enhancement of quality of community life; and (e) The economic benefits for this analysis take into account only the avoided net household monthly expenditure on energy sources (kerosene, batteries and charging fee) an average of Rs. 128. Kerosene prices reflect imported CIF cost. Additional consumer benefits related to convenience, improved safety, better indoor air quality, and higher quality of light were not included, due to lack of adequate valuation data.

**Main Beneficiaries:** (a) 100 medium and low income rural households<sup>3</sup>; (b) Village cooperatives; (c) Local small private investors.

### Main Assumptions:

See tables 4C.2 through 4C.5 for assumptions and analysis.

<sup>3</sup> The ESD Credit Line is expected to support about 20 such village hydro subprojects, serving a total of about 2,000 households.

**VILLAGE HYDRO CASE STUDY-- Sri Lanka-- Base Year 1997**  
12/17/96

**Table 4C.2: Project Profile**

<b>Name:</b>		<b>Sri Lanka Village Hydro</b>
<b>Location:</b>		<b>Representative Site</b>
Total Installation (kW)		15.00
Annual Production (GWH/a)		0.07
Capacity Utilizing Factor (%)		50.0%
Number of Customers		150
Customers using Batteries (before village hydro)		20%
Year 1		1997
Exchange rate (Rp/US\$)		53
Interest rate of loan (%/a)		18%
Share of Loan		60%
Term of Loan (Year)		10
Grace Period		1 yrs
Depreciation Period:		10 Yrs
Business Turnover Tax		15%
Import Duty		6%
Capacity of the first year		100%
Standard Conversion Factor		90%
GEF Grant (\$US millions)		6000
Value added tax rate on output		5.5%
Value added tax rate on input		5.5%
VAA tax rate		0%
Income tax rate for yrs 1-7		35%
Income tax rate for yrs 7-30		35%
Standard Discount Rate		12%
Annual Inflation Rate:		5.00%
International Inflation		2.5%

Table 4C.3: Calculation of Avoided Cost

	Financial		Economic	
	Quantity	Per Customer	Quantity	Per Customer
<b>Lighting</b>				
Kerosene Monthly Use (liters)	3.7		3.7	
Kerosene Cost Rp/liter	14.02		12.19	
<b>Monthly Kerosene Cost</b>		<b>52</b>		<b>45</b>
		<b>7780</b>		<b>6765</b>
<b>Wick Lantern Cost</b>	122		106	
Wick Lantern Life (years)	3		3	
Number of Wick Lanterns	1		1	
Wick Lantern Levelized Cost	4		4	
Monthly Wick Cost	9		8	
<b>Wick Lantern Monthly Cost</b>		<b>13</b>		<b>12</b>
		<b>1949</b>		<b>1800</b>
<b>Total Lighting Monthly</b>		<b>65</b>		<b>57</b>
		<b>9730</b>		<b>8566</b>
<b>Dry Cell Batteries</b>				
Dry Cell Battery Price			12.19	
Batteries Used Monthly			0	
<b>Dry Cell Battery Monthly</b>				<b>0</b>
				<b>0</b>
<b>Battery Costs</b>				
Charges Per Year	8		8	
Cost per charge	47		41	
<b>Monthly Charging Cost</b>		<b>31</b>		<b>27</b>
		<b>4693</b>		<b>4081</b>
<b>Battery Cost</b>	491		427	
Lifetime years	2		2	
<b>Battery levelized Cost</b>		<b>23</b>		<b>20</b>
		<b>3464</b>		<b>3012</b>
<b>Total Battery Monthly</b>		<b>54</b>		<b>47</b>
		<b>8157</b>		<b>7093</b>
<b>TOTAL MONTHLY Rs.</b>		<b>119</b>		<b>104</b>
		<b>17886</b>		<b>15658</b>
<b>TOTAL ANNUAL (Million Rs.)</b>		<b>0.21</b>		<b>0.19</b>

Table 4C.4: Economic Cashflow (million Constant 1997 Rp)

Year	Capital Cost	Operating Cost	Income	Net Benefit
1	1.31		0.00	-1.31
2		0.01	0.19	0.18
3		0.01	0.19	0.18
4		0.01	0.19	0.18
5		0.01	0.19	0.18
6		0.01	0.19	0.18
7		0.01	0.19	0.18
8		0.01	0.19	0.18
9		0.01	0.19	0.18
10	0.00	0.01	0.19	0.18
11		0.01	0.19	0.18
12		0.01	0.19	0.18
13		0.01	0.19	0.18
14		0.01	0.19	0.18
15		0.01	0.19	0.18
16		0.01	0.19	0.18
17		0.01	0.19	0.18
18		0.01	0.19	0.18
19		0.01	0.19	0.18
20	0.00	0.01	0.19	0.18
<b>Total</b>	<b>1.31</b>	<b>0.23</b>	<b>3.57</b>	<b>2.03</b>
<b>NPV</b>	<b>1.17</b>	<b>0.09</b>	<b>1.24</b>	<b>-0.02</b>
<b>IRR</b>				<b>11.8%</b>

**Table 4C.5: Financial Cash Flow With GEF Grant, Inflation, Debt Financing, Income Tax (million Current Rp)**

Year	Investment		Loan Interest	Operating Cost	Total Cost	Gross Income	VAF <sup>1</sup> /VA Tax	Income Tax		Net Benefit
	Equity	Loan Principal								
1	0.17	0.00	0.05	0.00	0.22	0.00	0.00	0.00	0.00	-0.22
2		0.08	0.09	0.01	0.18	0.21	0.01	0.00	0.00	0.02
3		0.08	0.08	0.01	0.17	0.23	0.01	0.01	0.01	0.03
4		0.08	0.07	0.01	0.17	0.24	0.01	0.02	0.02	0.04
5		0.08	0.06	0.02	0.16	0.25	0.01	0.03	0.03	0.05
6		0.08	0.05	0.02	0.15	0.26	0.01	0.03	0.03	0.06
7		0.08	0.04	0.02	0.14	0.27	0.01	0.04	0.04	0.08
8		0.08	0.03	0.02	0.13	0.29	0.02	0.05	0.05	0.09
9		0.08	0.02	0.02	0.12	0.30	0.02	0.06	0.06	0.11
10		0.08	0.01	0.02	0.11	0.32	0.02	0.07	0.10	0.12
11		0.00	0.00	0.02	0.03	0.33	0.02	0.10	0.19	0.19
12		0.00	0.00	0.02	0.02	0.35	0.02	0.11	0.20	0.20
13		0.00	0.00	0.02	0.02	0.37	0.02	0.11	0.21	0.21
14		0.00	0.00	0.02	0.02	0.39	0.02	0.12	0.22	0.22
15		0.00	0.00	0.03	0.03	0.40	0.02	0.13	0.23	0.23
16		0.00	0.00	0.03	0.03	0.42	0.02	0.13	0.24	0.24
17		0.00	0.00	0.03	0.03	0.45	0.02	0.14	0.26	0.26
18		0.00	0.00	0.03	0.03	0.47	0.02	0.15	0.27	0.27
19		0.00	0.00	0.03	0.03	0.49	0.03	0.15	0.28	0.28
20		0.00	0.00	0.03	0.03	0.52	0.03	0.16	0.30	0.30
Total NPV IRR	0.17 0.15	0.73 0.39	0.51 0.32	0.41 0.12	1.82 0.98	6.55 1.93	0.35 0.10	1.61 0.36	2.78 0.49	28.8%



**MINI-HYDRO CASE STUDY- Sri Lanka- Base Year 1997**  
12/17/96

**Table 4D.2: Project Profile**

Name:	Sn Lanka Minihydro					
Location:	Ellapita Ella					
Total Installation (kW)	580.00					
Annual Production (GWH/a)	2.26					
Capacity Utilizing Factor (%)	44.5%					
Avoided Cost of Power (Rp/MWt)	3368.55					
Power Sales Price (Rp/MWh)	3368.55					
Year 1	1997					
Exchange rate (Rp/US\$)	53.00					
Interest rate of loan (%/a)	18%					
Share of Loan	49%					
Term of Loan (Year)	7					
Grace Period	2 yrs					
Depreciation Period:	20 Yrs					
Import Duty:	0%					
VAT on Imports	0%					
Capacity of the first year	100%					
Standard Conversion Factor	90%					
GEF Grant (\$US millions)	0					
Value added tax rate on output	6%					
Value added tax rate on input	0%					
VAA tax rate	0%					
Income tax rate for yrs 1-7	15%					
Income tax rate for yrs 7-30	35%					
Standard Discount Rate	12%					
Inflation Rate:	1997	1998	1999	2000	2001	After 2001
	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
International Inflation	2.5%					

**Table 4D.3: Economic Cashflow (million Constant 1997 Rp)**

Year	Capital Cost	Operating Cost	Income	Net Benefit
1	37.29		0.00	-37.29
2		0.56	7.61	7.05
3		0.56	7.61	7.05
4		0.56	7.61	7.05
5		0.56	7.61	7.05
6		0.56	7.61	7.05
7		0.56	7.61	7.05
8		0.56	7.61	7.05
9		0.56	7.61	7.05
10	0.53	0.56	7.61	6.53
11		0.56	7.61	7.05
12		0.56	7.61	7.05
13		0.56	7.61	7.05
14		0.56	7.61	7.05
15		0.56	7.61	7.05
16		0.56	7.61	7.05
17		0.56	7.61	7.05
18		0.56	7.61	7.05
19		0.56	7.61	7.05
20	1.80	0.56	7.61	5.25
Total	39.62	10.60	144.58	94.36
NPV	34.99	4.11	50.04	12.72
IRR				18.0%

Table 4D.4: Financial Cash Flow With Inflation, Debt Financing, Income Tax (million Current Rp)

Year	Investment		Operating Cost	Total Cost	Gross Income	VAF/VAA Tax	Income Tax	Net Benefit
	Equity	Loan Principal	Loan Interest					
1	19.12	0.00	1.71	20.83			0.00	-20.83
2		0.00	3.42	4.10	8.39	0.49	0.00	3.79
3		3.80	3.08	7.60	8.81	0.52	0.00	0.69
4		3.80	2.39	6.95	9.25	0.54	0.29	1.47
5		3.80	1.71	6.30	9.71	0.57	0.45	2.39
6		3.80	1.03	5.66	10.20	0.60	0.72	3.22
7		3.80	0.34	5.01	10.71	0.63	0.89	4.18
8		0.00	0.00	0.92	11.24	0.66	1.01	8.66
9		0.00	0.00	0.96	11.80	0.69	1.08	9.07
10	0.53	0.00	0.00	1.53	8.39	0.49	0.59	5.78
11		0.00	0.00	1.06	12.39	0.73	1.53	9.08
12		0.00	0.00	1.11	8.39	0.49	0.96	5.83
13		0.00	0.00	1.17	13.01	0.76	1.60	9.48
14		0.00	0.00	1.23	13.67	0.80	1.68	9.95
15		0.00	0.00	1.29	14.35	0.84	1.77	10.45
16		0.00	0.00	1.35	15.07	0.88	1.86	10.97
17		0.00	0.00	1.42	15.82	0.93	1.96	11.51
18		0.00	0.00	1.49	16.61	0.97	2.06	12.08
19		0.00	0.00	1.57	17.44	1.02	2.17	12.68
20	1.8	0.00	0.00	1.65	18.31	1.07	2.28	11.52
Total	21.45	19.00	13.68	20.87	75.00	13.71	22.89	121.96
NPV	18.77	10.92	9.61	6.90	44.12	4.66	5.26	17.28
IRR								20.7%

**Annex 5**  
**SRI LANKA**  
**ENERGY SERVICE DELIVERY (ESD) PROJECT**  
**FINANCIAL SUMMARY**

Part I of this Annex presents the eligibility criteria for participating credit institutions (PCIs). The second part of this Annex provides financial highlights of potential PCIs which demonstrate their capability to meet the eligibility criteria.

**Part I: Eligibility Criteria for Participating Credit Institutions**

**A. For all Participating Credit Institutions (PCIs)**

1. Except as IDA shall otherwise agree, each PCI shall satisfy the following criteria in order to be eligible to participate under the Project.
  - (a) in the case of commercial banks and development finance institutions (DFIs), eligibility criteria established under the ongoing Private Finance Development Project (PFDP) and those under the proposed Energy Service Delivery (ESD) Project;
  - (b) in the case of merchant banks and leasing companies, eligibility criteria set out in section C below; and
  - (c) not disqualified from participating in other IDA or ADB credit operations.
2. In order to become eligible to participate in the ESD Credit Program and to maintain their eligibility, credit institutions must be privately owned and controlled, and meet the following criteria.
  - (a) IDA should receive a satisfactory statement approved by the Board of Directors of the institutions outlining:
    - (i) proposal as to how they would plan to utilize the credit facility, how they would get internally organized to market the ESD scheme, evaluate the subproject proposals and manage subsequent follow-up monitoring and loan recoveries;
    - (ii) name of the senior officer who will be in charge of ESD credit operation and key team staff;
    - (iii) newly established institutions which are not PCIs under the PFDP should submit the institution's business strategy and operating policies; and
    - (iv) details of their existing term lending programs and portfolio management scheme, if any.
  - (b) Except as IDA shall otherwise agree, a profitable operation for at least two full years of operation preceding its application for participation, attested to by unqualified audit reports from independent private auditors acceptable to IDA.

**B. Eligibility Criteria under ESD Project for Commercial Banks and DFIs**

3. Compliance with Ministry of Finance/Central Bank guidelines on prudential regulations, capital adequacy, classification of risk assets, provisioning, single borrower exposure limit, sector exposure limits, and disclosure and reporting requirements.

4. A confirmation from external auditors acceptable to IDA that, at the date of its application for participation and subsequently at the end of its financial year, the credit institution met the following financial criteria, ratio requirements and exposure limits calculated in accordance with IDA standard guidelines:

- (a) a minimum total cash collection ratio of principal and interest on term loan portfolio calculated on a rolling twelve month basis of 80%;
- (b) a minimum total cash collection ratio of principal only on term loan portfolio calculated on a rolling twelve month basis of 80%;
- (c) a minimum after tax profit equivalent to 9% p.a. on average shareholders' funds;
- (d) a minimum debt service cover ratio of 1.25 times (only for DFIs and similar institutions);
- (e) a maximum portfolio infection rate of 20%;
- (f) a maximum debt equity ratio of 8:1;
- (g) minimum capital adequacy ratios of 4% and 8% for tier-1 and tier-2, respectively as required by Central Bank of Sri Lanka (CBSL) guidelines;
- (h) loans to any one party or to any one group of companies must not exceed 10% of PCI's total assets; and
- (i) loans to any one sector, as defined in the UN Standard Classification of Economic Activities, must not exceed 30% of PCI's total loan portfolio.

C. For Merchant Banks and Leasing Companies

5. A confirmation from external auditors acceptable to IDA that, at the date of its application for participation and subsequently at the end of its financial year, the credit institution met the following financial criteria, ratio requirements and exposure limits calculated in accordance with IDA standard guidelines:

- (a) the financial soundness criteria listed in paragraph (4) above;
- (b) profitable operation at least two full years of operation preceding its application for participation as per paragraph (2) above; and
- (c) merchant bank or leasing company in question is privately owned and controlled.

6. Compliance with pertinent laws and regulations regarding capital adequacy, classification of assets, non-accrual of interest and provisioning, exposure limits, etc.

7. In the absence of relevant regulatory framework, merchant banks or leasing companies that wish to participate in the Credit Program should adopt and comply with their own financial policies acceptable to IDA, which might be tighter than the eligibility requirements listed in paragraph (4) above. A Confirmation from external auditors acceptable to IDA that, at the date of its application for participation and subsequently at the end of its financial year, the credit institution is in full compliance with its own financial policies. Any changes in financial policies of these institutions would be subject to prior review and approval by IDA.

## Part II: Financial Highlights of Potential PCIs

8. Four private domestic commercial banks namely, Hatton National Bank (HNB), Sampath Bank, Seylan Bank, Commercial Bank of Ceylon (CBOC), the two DFIs namely National Development Bank (NDB) and Development Finance Corporation of Ceylon (DFCC), and one merchant bank namely Vanik Incorporation Ltd. have been evaluated. Detailed assessment of their eligibility is available in the Project File. As can be seen from statistical financial highlights presented in Table below, seven financial institutions noted above demonstrate their ability to meet the eligibility criteria. More specifically, these institutions have the following characteristics:

- They are privately owned and controlled, and have been profitable at least for three years.
- Their cash collection ratio of principal and interest ranged from 84.0% to 96.0% in 1995 as against the minimum of 80% (stated in the eligibility criteria)..
- Their cash collection ratio of principal only ranged from 86.8% to 96.0% in 1995 as against the minimum of 80%.
- Their (after tax) return on average equity ranged from 10.6% to 31.8% in 1995 as against the minimum of 9%.
- Debt service cover ratio of the two DFIs ranged 1.9 times to 2.9 times in 1995 as against the minimum of 1.25 times.

Loans outstanding affected by arrears (for over 180 days) ranged from 0.6% to 14.7% as of December 31, 1995 (and March 31, 1996 for DFCC) as against the maximum of 20%.

- The core capital (to risk-adjusted assets) ratio (or tier 1 capital adequacy ratio) ranged from 6.8% to 27.2% at the end of 1995 as against the minimum of 4%. The total net worth to risk-adjusted assets (or tier 2) ratio ranged from 8.8% to 27.2% at the end of 1995 as against the minimum of 8%.
- Their (long-term) debt to equity ratio ranged from 0.2 : 1 to 2.8 : 1 at the end of 1995 as against the maximum of 8 : 1.
- They confirmed that their loans to any one party or to any group of companies did not exceed 10% of their total assets and that loans to any one sector, as defined in the UN Standard Classification of Economic Activities did not exceed 30% of their total loan portfolio at the end of 1995.

9. Their participation in the ESD credit program will be subject to: (a) a confirmation from the Central Bank of Sri Lanka (CBSL) that, at the date of their application for participation, the credit institutions (commercial banks and DFIs) are in compliance with CBSL's regulations; (b) a confirmation from the external auditors acceptable to IDA that, at the date of their applications for participation, the credit institutions meet the specific financial soundness criteria noted in the eligibility criteria; and (c) submission of a (Board approved) statement referred to in paragraph 2-(a) of the Eligibility Criteria. In the case of merchant banks (and/or leasing companies) for which regulatory framework and supervision system have yet to be established, the institutions should adopt and comply with their own financial policies acceptable to IDA. Their participation will be subject to: (i) a confirmation from external auditors acceptable to IDA that, at the date of their application, the institutions are in full compliance with their own financial policies acceptable to IDA and that the institutions fully meet the financial soundness criteria listed in paragraph 4 of the Eligibility Criteria; and (ii) submission of a (Board approved) statement referred to in paragraph 2-(a) of the Eligibility Criteria.



### Financial Highlights of Potential Participating Credit Institutions (PCIs)

Financial Highlights PCIs	31-Dec-95 HNB	31-Dec-95 Sampath	31-Dec-95 Seylan	31-Dec-95 CBOC	31-Dec-95 NDB	31-Mar-96 DFCC	31-Dec-95 VANI
Number of Branches	61	23	83	36	3	3	1
Number of Employees	2,690	901	2,426	1,845	223	201	146
<b>KEY FINANCIAL FIGURES:</b>							
Total Assets (Rs million)	30,085	11,935	26,515	19,065	16,623	15,277	3,731
Paid up Capital (Rs million)	120	354	396	125	175	302	425
Shareholders Funds (Rs million)	2,138	940	1,138	2,058	3,514	3,779	990
Net Profit After Tax (Rs million)	483	241	290	329	636	590	82
Interest Income on Loans as % of Ave Loans Outstanding	19.6%	19.4%	20.5%	17.6%	17.3%	20.1%	24.5%
Interest Expenses as % of Ave Borrowing	8.8%	9.4%	10.3%	8.2%	13.3%	13.3%	19.5%
Interest Spread	10.8%	10.0%	10.2%	9.4%	4.0%	6.8%	5.0%
Operating Expenses as % of Ave. Total Assets	4.3%	4.6%	4.1%	5.0%	1.3%	1.8%	4.9%
Net Profit After Tax as % of Average Total Assets	1.8%	2.2%	1.2%	1.8%	4.2%	4.5%	2.9%
Net Profit After Tax as % of Average Equity	25.0%	30.2%	31.8%	18.0%	21.4%	16.7%	10.6%
Capital Adequacy Ratio - Tier - 1	9.5%	13.3%	6.8%	13.6%	20.4%	27.2%	25.1%
- Tier - 2	10.4%	14.5%	8.8%	13.9%	22.6%	27.2%	25.1%
Cash Collection Ratio - Principal Only	86.0%	88.0%	87.0%	96.0%	87.4%	86.8%	92.0%
- Princ. & Interest	86.0%	84.0%	86.3%	96.0%	86.0%	89.9%	92.0%
Portfolio Affected by arrears (%)	4.0%	9.5%	14.7%	11.9%	4.0%	8.1%	0.6%
Long Term Debt to Equity Ratio	0.32:1	0.22:1	0.36:1	1.01:1	2.34:1	2.24:1	2.8:1
Debt Service Cover Ratio (times)	NA	NA	NA	NA	1.9	2.9	1.3

NA = Not Applicable

## Annex 6

### Procurement, Disbursement and Auditing Arrangements

#### **Procurement**

##### ***ESD Credit Line Component:***

- ICB for goods contracts in excess of \$2.0 million.
- ICB for works contracts in excess of \$3.0 million.
- ICB for turnkey contracts in excess of \$5.0 million.
- Established commercial practices will be utilized for all non-ICB contracts. Three quotes will be required to ensure competitive prices. An opinion from an independent expert acceptable to IDA on the reasonableness of quoted prices will be required for all contracts where 3 quotes are not received.

The PCIs will be required to maintain details of the procurement methods used by sub-borrowers and to monitor the utilization of subloan funds for procurement through regular site supervision visits; Administrative Unit staff and IDA field supervision missions will continue to review implementation of these procedures.

##### ***Wind Farm and Capacity Building Components:***

- ICB for goods contracts in excess of \$200,000.
- NCB for goods contracts between \$25,000 and \$200,000.
- NCB for works contracts in excess of \$25,000.
- Local/international shopping with a minimum of 3 quotations for goods and works contracts below \$25,000.
- Selection of consultants will follow the *Guidelines for the Use of Consultants by World Bank Borrowers*.

##### ***Prior review:***

- All subloan ICB contracts.
- All goods and works contracts under the Wind Farm and Capacity Building components.
- The letter of invitation to bid, terms of reference and short list for all consultant services contracts under the Wind Farm and Capacity Building components.

#### **Disbursement**

The Project has a projected five-year disbursement period.

##### ***ESD Credit Line Component:***

#### **A. IDA Funds**

- The final date for submitting financing applications would be three years after Credit effectiveness. The Closing Date for the Credit would be five years after Credit Effectiveness.
- The Administrative Unit (AU) will process disbursement requests for subloans and grants approved by PCIs under their free limit, and disbursement requests for subloans and grants above the free limit approved by IDA. First two subloan proposals, irrespective of size, presented by any PCI, and all subloan proposals for solar home systems would also be subject to prior approval by IDA.
- Eligibility of expenditures below "PCI's free limit" subloan would be ascertained by the AU and disbursements for all subloans would be made against full documentation. Detailed

documentation evidencing expenditures would be kept by the AU for external audits and for review by IDA supervision missions.

- IDA funds would be used to reimburse up to 60% of amounts of subloans made by PCIs for subproject-related expenditures incurred no more than 120 days prior to the date on which IDA receives the relevant information on subloan/ subproject proposals together with corresponding subproject documentation.
- The AU would have the authority to notify the Central Bank of Sri Lanka (CBSL) to make payments from the Special Account to the PCI and be responsible for keeping track of this Account.

#### B. GEF Grant Financing

Grant funds will be available to off-grid subproject developers who have signed a subloan agreement with a PCI. Grants would be disbursed on a reimbursement basis, after installation of the off-grid system, and upon presentation of certificates noted below and documentation showing eligible expenditures.

##### Village Hydro

- Grant funds of US\$400 per kilowatt of village hydro installed will be provided, but the maximum amount of grant funds per village hydro will be US\$20,000.
- The AU will process the grant release for the subproject, within one week of receipt of certification by a Chartered Engineer that the entire system (including civil works, electromechanical, distribution system, and house wiring for beneficiaries) is complete, complies with the most recent village hydro specifications, and is operational.

##### Solar Home System (SHS)

Grant funds of US\$100 per solar home system with module of 30 watt or greater will be provided. A household cannot receive more than one SHS grant, and each PV module would be eligible for no more than one grant or loan.

PCIs are responsible for verifying that proposed solar home systems conform to the most recent Specifications for Solar Home Systems. To facilitate such a verification, the AU will administer TA funds for PCIs to retain consultants for this purpose and will maintain a list of consultants acceptable to IDA who are capable of verifying that the system proposed in the subloan application meets the most recent Specifications for Solar Home Systems.

- The AU will maintain a list of photovoltaic modules imported for potential use in ESD funded installations based on information provided by importers through PCIs.
- The AU will process the grant release upon receipt of a complete installation certificate of the dealers through the PCIs and verification that (i) the installed module was on the PV module list maintained by the AU; (ii) the module had not been used previously to apply for an ESD Grant; and (iii) the household had not previously received an ESD Grant.
- The AU will ensure that the Installation Certificate contains the following information: (i) serial number of photovoltaic module installed; (ii) name, national identification number, and address of customer; and (iii) signature of customer indicating acceptance of the system and agreement to the terms of the loan, lease or other contract with PV system supplier, and certifying that the household had not previously received an SHS grant under the ESD Project; (iv) date of acceptance that the system is satisfactory and operational; and (v) signature of the dealer indicating that the system complies with the most recent Specifications



for Solar Home Systems and that the module installed has not previously been used to acquire a grant under the ESD project or other program.

- PCIs will also be responsible for verifying actual SHS installations. To facilitate such a verification, the AU will also administer TA funds for PCIs to retain consultants to verify, on a sampling basis, (i) module serial numbers given on grant applications; and (ii) compliance of installed systems with the PV Specifications. The AU will follow up with remedial action upon receipt of a PCI report of irregularities. If the remedial action is unsuccessful, suspension of dealers from the Credit Program is required and the AU will notify all PCIs.

#### **Off-grid Project Preparation Technical Assistance**

- Each off-grid subproject developer would be eligible for only one grant to help prepare feasibility studies, business plans and bank loan documentation for off-grid subprojects. Grants would cover only independent consulting services on a reimbursement basis up to 90% of the cost of preparation for a SHS subproject (up to US\$6,500) and 95% of the preparation cost of a village hydro subproject (up to US\$9,000).
- Reimbursement would require PCI approval of a subproject on the basis of a complete feasibility study/business plan/bank loan application package, presentation of eligible expenditures and submission of a disbursement request(s) for IDA funds equal to or exceeding the GEF grant amount. Only those expenditures incurred after September 1, 1996 would be eligible for reimbursement.

#### **Wind Farm and Capacity Building Components:**

- IDA and GEF funds will be disbursed on a pari passu basis against 100% of the foreign expenditures under the Wind Farm EPC contract.
- Prior authorization by IDA for all goods and services under the Capacity Building component will be required.
- IDA will disburse against the principle amount of the Project Preparation Advance withdrawn and outstanding as of the effectiveness of the credit and all unpaid charges thereon.

#### **Statements of Expenditure**

Disbursements will be made on the basis of Statements of Expenditure (SOE) for:

- Subloans below each PCI's free limit;
- Contracts of less than US\$200,000 equivalent for works and goods under the Wind Farm and Capacity Building components; and
- Consultants contracts of less than US\$100,000 equivalent for firms and US\$50,000 equivalent for individuals under the Wind Farm and Capacity Building components.

#### **Special Accounts**

- To facilitate disbursement of IDA and GEF funds allocated for the Credit Program, a Special Account with an initial deposit of US\$780,000 (\$660,000 IDA, \$120,000 GEF) would be established.
- A special account, administered by the CEB, with an initial deposit of \$106,000 (\$100,000 IDA, \$6,000 GEF) will be established to facilitate disbursement of IDA and GEF funds under the Wind Farm and Capacity Building components.

### **Project Accounts and Audits**

- The executing agencies (Administrative Unit and CEB) will maintain **separate** accounts of Project expenditures in accordance with sound accounting practice.
- The Administrative Unit will retain PCI documentation and withdrawal application documentation for inspection during IDA/GEF supervision missions.
- All statements of expenditure, together with supporting documentation, will be audited annually by an independent auditor satisfactory to IDA.

**Table A: Project Costs by Procurement Arrangements**

Expenditure Category	Procurement Method				Total Cost
	ICB	NCB	Other	NBF	
<b>1. <u>Credit Program Subloans</u></b>					
(a) Goods			19.0 (11.90)	5.2	24.2 (11.90)
(b) Works			16.5 (10.6)	4.6	21.1 (10.6)
(c) Services			1.9 (1.1)	0.50	2.4 (1.1)
<b>2. <u>Pilot Wind Farm (EPC contract)</u></b>	2.8 (2.5)		0.9 (0.5)		3.7 (3.0)
<b>3. <u>Capacity Building</u></b>		0.9	0.3	0.3	1.5
(a) Consulting Services and Training		(0.9)	(0.3)		(1.2)
(b) Goods	0.1 (0.1)	0.6 (0.6)	0.1 (0.1)	0.1	0.9 (0.8)
<b>4. <u>Unallocated</u></b>			1.5 (1.5)		1.5 (1.5)
<b>Total</b>	<b>2.9 (2.6)</b>	<b>1.5 (1.5)</b>	<b>40.2 (26.0)</b>	<b>10.7</b>	<b>55.3 (30.1)</b>

**Note:** NBF = Not Bank-Financed.  
Figures in parentheses are the amounts to be financed by the IDA Credit and GEF Grant.

**Table B: IDA Loan Disbursement Arrangements**

Expenditure Category	Amount in US\$ (millions)	Expenditures to be Financed
1. <u>Credit Program Subloans</u>	19.8	60% of subloan amount
2. <u>Pilot Wind Farm (EPC contract)</u>	2.2	75% of foreign expenditures; 50% of local expenditures
3. <u>Capacity Building</u>		
(a) Consulting Services and Training	0.7	100% of expenditures
(b) Goods	0.3	100% of foreign expenditures; 100% of the ex-factory cost of local expenditures; 80% of local expenditures
4. <u>Unallocated</u>	1.2	100% of expenditures
<b>Total</b>	<b>24.2</b>	

**Table C: GEF Grant Disbursement Arrangements**

Expenditure Category	Amount in US\$ (millions)	Expenditures to be Financed
1. <u>Credit Program Off-grid Subproject Grants</u>		
(a) Subproject preparation	0.3	95% of village hydro feasibility study costs; 90% of solar PV business plan preparation costs
(b) System/project cost buy-down	3.0	\$400 per kW for village hydro subprojects; \$100 per solar PV system
2. <u>Pilot Wind Farm</u>	0.8	25% of foreign expenditures
3. <u>Technical Assistance</u>		
(a) Consulting Services and Training	0.9	100% of expenditures
(b) Goods	0.1	100% foreign expenditures; 100 percent of the ex-factory cost of local expenditures; 80% of local expenditures
4. <u>Administrative Unit Off-Grid Project Support</u>	0.5	100% of GEF project support activities
5. <u>Unallocated</u>	0.3	
<b>Total</b>	<b>5.9</b>	

# Annex 7

## Sri Lanka: Energy Services Delivery Project Project Processing Budget and Schedule

### A. Project Budget (US\$000)

Planned  
(At REPS stage)  
\$378,000

Actual  
\$344,700\*

### B. Project Schedule

Planned  
(At REPS stage)

Actual

Time taken to prepare the project (months)

10/20/1994

10/20/1994

First Bank mission (identification)

8/18/1995

6/24/1996

Appraisal mission departure

1/11/1996

12/16/96\*

Negotiations

7/28/1996

June 1997\*

Planned Date of Effectiveness

Prepared by: [name of Government agency]

- Ministry of Finance; and
- Ceylon Electricity Board

Preparation assistance: [PPF, trust funds, cofinanciers, etc.]

PPF: \$340,000

Trust Funds: \$505,600 (Netherlands, USDOE, USTDA)

GEF PPA: \$200,000

GEF BB: \$202,200

Bank staff who worked on the project included: Loretta Schaeffer (Task Manager), Mac Cosgrove-Davies, Joon Bo Shim, Scott Piscitello, Carolyn Tager, Anil Cabraal, Sumith Pilapitiya, Sriyani Hulugalle.

\* as of 10/31/96

**Annex 8**

**Sri Lanka  
Energy Services Delivery Project  
Documents in the Project File**

**A. Project Implementation Plan**

**B. Bank Staff Assessments**

1. Sri Lanka, Private Sector Assessment, March 1995.
2. Detailed assessments of PCI Eligibility for ESD Credit Program.
3. Sri Lanka In The Year 2000 - An Agenda for Action, March 1996

**C. Other**

1. Posch & Partners, Consulting Engineers, Sri Lanka Micro Hydro Feasibility Study, January 1994.
2. Consultant and Professional Services, (Pvt) Ltd. Sri Lanka Energy Services Delivery Project, Project Pipeline Development, Review of Existing Village Hydro Schemes, July 1995.
3. Consultant and Professional Services, (Pvt) Ltd., Identification of Off-Grid Electrification Projects with Potential for Development and Selection of Four Projects to Receive Preparation Assistance, August 1995.
4. Consultant and Professional Services, (Pvt) Ltd., Feasibility Study on the Establishment of a New Village Hydro Project at Pathavita under Sri Lanka: Energy Services Delivery Project, November 1995.
5. Consultant and Professional Services, (Pvt) Ltd., Business Plan for the Establishment of New Village Hydro Project at Pathavita under Sri Lanka: Energy Services Delivery Project, November 1995.
6. Consultant and Professional Services, (Pvt) Ltd., Feasibility Study on the Establishment of a Solar PV Project by the Lanka Jathika Sarvodaya Shramadana Sangamaya under Sri Lanka: Energy Services Delivery Project, November 1995.
7. Consultant and Professional Services, (Pvt) Ltd., Business Plan of the Solar PV Project of the Lanka Jathika Sarvodaya Shramadana Sangamaya under Sri Lanka: Energy Services Delivery Project, November 1995.
8. Steven Ferry, Final Report on the Sri Lanka Standardized Contract and Tariff for the Acquisition of Electric Energy and Capacity from Small Power Producers, December 1995.
9. Robert Vernstrom, Final Report on the Published Small Power Purchase Tariff for Sri Lanka, December 1995.
10. Consultant and Professional Services, (Pvt) Ltd., Feasibility Study on the Establishment of a Grid Connected Minihydro Power Project, June 1996.
11. Romesh Bandaranaike, Mini Hydro Power Project: Kirkoswald Estate, Feasibility Study, May 1996.
12. RLA Consulting. Feasibility Study for a 3 MW Pilot Wind Farm in Sri Lanka, September 1996.



**Status of Bank Group Operations in SRI LANKA**  
**IBRD Loans and IDA Credits in the Operations Portfolio**  
**(As of September 30, 1996)**

Project ID	Loan or Credit No.	Fiscal Year	Borrower	Purpose	Original amount in US\$ millions				Difference between expected and actual disbursements <sup>a</sup>
					IBRD	IDA	Cancellations	Undisbursed	
Number of Closed Loans/Credits:					66				
Active Loans									
LK-PA-10276	C17760	1987	GOSL	AGRIC. RESEARCH		18.60	3.22	1.73	2.28
LK-PA-10308	C19090	1988	GOP	SMALLHOLDER RUBBER		23.50	5.18	6.63	8.69
LK-PA-10332	C20430	1989	GOSL	FORESTRY II		19.90	6.51	4.85	9.75
LK-PA-10343	C20720	1990	GOSL	GENERAL EDUCATION		49.00		6.86	-0.59
LK-PA-10363	C21830	1991	GOSL	3RD ROADS		42.50		20.83	12.90
LK-PA-10368	C22310	1991	GOSL	POVERTY ALLEVIATION		57.50		32.56	31.12
LK-PA-10373	C22490	1991	GOSL/CEB	TELECOMS II		57.00		37.02	36.34
LK-PA-10374	C22500	1991	GOSL	SMI IV		45.00		5.63	2.76
LK-PA-10378	C22600	1991	GOSL	IRRIG. REHAB.		29.60		23.90	14.09
LK-PA-10386	C22970	1992	GOSL	POWER DISTRIBUTION		50.00		43.01	32.77
LK-PA-10398	C23800	1992	GOSL	2ND AGR. EXTENSION		14.34		10.84	2.14
LK-PA-10409	C24420	1993	GOSL	COMMUNITY WATER SUPP		24.30		15.17	4.47
LK-PA-10419	C24840	1993	GOSL	PRIVATE FINANCE DEV.		60.00		15.97	-3.01
LK-PA-10420	C24950	1993	GOSL	COLOMBO URB. TRANSP.		20.00		12.47	4.62
LK-PA-10467	C27570	1995	GOSL	COL. ENVIRON. IMPROVE.		39.00		33.31	2.22
LK-PA-10517	C28800	1996	GOSL	PVT. SECTOR INFRAS. DEV		77.00		76.35	
LK-PA-42263	C28370	1996	GOSL	TELECOM REG. & PUBL.		15.00		14.41	1.46
LK-PA-42266	C28810	1996	GOSL	TEACH ED& DEPLOYMENT		64.10		63.50	0.28
TOTAL					0.00	706.34	14.91	425.04	162.29

	Active Loans	Closed Loans	Total
Total disbursed (IBRD and IDA)	291.95	1293.82	1585.77
Of which repaid	0.00	154.27	154.27
Total now held by IBRD and IDA	691.42	1100.16	1791.58
Amount sold	0.00	3.59	3.59
Of which repaid	0.00	3.59	3.59
Total undisbursed	425.05	1.63	426.68

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

**Note**

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

**Sri Lanka - Statement of IFC Investments**  
**Committed and Disbursed Portfolio**  
**As of September 30, 1996**  
**(In US Dollar Millions)**

		Committed				Disbursed			
		IFC				IFC			
<i>FY Approval</i>	<i>Company</i>	<i>Loan</i>	<i>Equity</i>	<i>Quasi</i>	<i>Partic</i>	<i>Loan</i>	<i>Equity</i>	<i>Quasi</i>	<i>Partic</i>
1980/84/96	Lanka Orix	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1981	Lanka Hotels	0.00	0.64	0.00	0.00	0.00	0.64	0.00	0.00
1985	Lanka Orix	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1988/95	Union Assurance	0.00	0.98	0.00	0.00	0.00	0.98	0.00	0.00
1992	CKN Fund Mgmt.	0.00	0.06	0.00	0.00	0.00	0.06	0.00	0.00
1992	Pyramid Trust	0.00	0.25	0.00	0.00	0.00	0.25	0.00	0.00
1993/94	Lanka Cellular	0.00	2.03	0.00	0.00	0.00	2.03	0.00	0.00
	<b>Total Portfolio:</b>	<b>10.00</b>	<b>3.96</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>3.96</b>	<b>0.00</b>	<b>0.00</b>
		<b>Approvals Pending Commitment</b>							
		<i>Loan</i>	<i>Equity</i>	<i>Quasi</i>	<i>Partic</i>				
1996	ASIA POWER	0.00	0.00	0.00	0.00				
	<b>Total Pending Commitment:</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>				



## Sri Lanka at a glance

### POVERTY and SOCIAL

	Sri Lanka	South Asia	Low-income
Population mid-1995 (millions)	18.1	1,243	3,188
GNP per capita 1995 (US\$)	690	350	460
GNP 1985 (billions US\$)	12.6	435	1,466

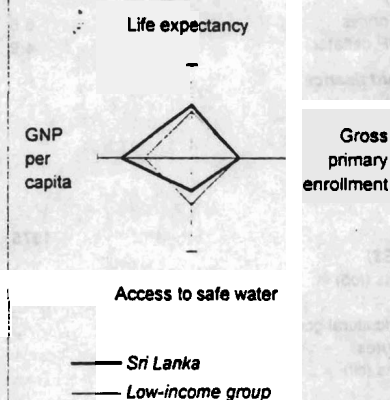
#### Average annual growth, 1990-95

Population (%)	1.2	1.9	1.8
Labor force (%)	2.0	2.4	1.9

#### Most recent estimate (latest year available since 1989)

Poverty: headcount index (% of population)	22	..	..
Urban population (% of total population)	22	26	29
Life expectancy at birth (years)	72	61	63
Infant mortality (per 1,000 live births)	16	73	58
Child malnutrition (% of children under 5)	38	62	38
Access to safe water (% of population)	53	81	75
Illiteracy (% of population age 15+)	10	50	34
Gross primary enrollment (% of school-age population)	106	98	105
Male	106	110	112
Female	105	87	98

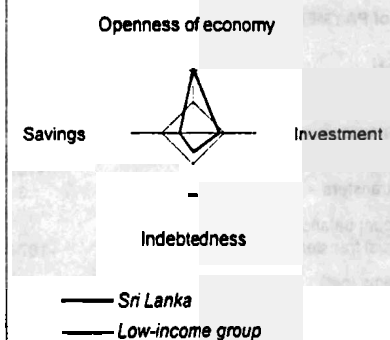
#### Development diamond\*



### KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1975	1985	1994	1995
GDP (billions US\$)	3.8	6.1	11.7	12.9
Gross domestic investment/GDP	15.6	23.4	27.0	25.1
Exports of goods and non-factor services/GDP	27.5	25.6	33.7	35.9
Gross domestic savings/GDP	8.1	11.7	15.0	14.1
Gross national savings/GDP	7.4	14.0	19.0	18.3
Current account balance/GDP	-4.9	-9.8	-8.0	-7.9
Interest payments/GDP	0.5	1.9	1.1	1.3
Total debt/GDP	21.5	58.2	66.7	64.1
Total debt service/exports	26.1	16.5	8.5	10.9
Present value of debt/GDP	..	..	40.8	..
Present value of debt/exports	..	..	99.9	..

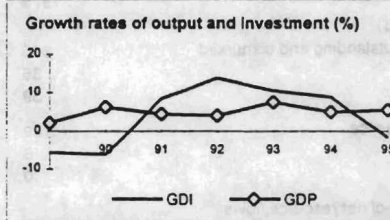
#### Economic ratios\*



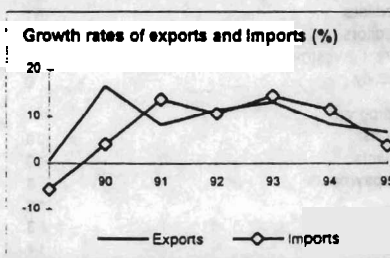
	1975-84	1985-95	1994	1995	1996-04
(average annual growth)					
GDP	5.7	4.3	5.1	5.5	4.9
GNP per capita	3.7	3.1	4.0	3.9	3.7
Exports of goods and nfs	4.0	7.3	8.4	6.7	7.3

### STRUCTURE of the ECONOMY

	1975	1985	1994	1995
(% of GDP)				
Agriculture	30.4	27.7	24.0	23.0
Industry	26.4	26.2	24.7	26.1
Manufacturing	20.1	14.7	15.6	15.7
Services	43.2	46.1	51.4	50.9
Private consumption	82.6	78.3	75.6	74.0
General government consumption	9.3	10.1	9.4	11.8
Imports of goods and non-factor services	35.0	37.3	45.7	46.9



	1975-84	1985-95	1994	1995
(average annual growth)				
Agriculture	1.3	1.8	3.3	3.3
Industry	5.3	6.2	8.1	7.7
Manufacturing	4.1	6.9	9.1	9.2
Services	6.7	4.7	7.4	5.1
Private consumption	7.0	3.8	5.5	4.7
General government consumption	3.0	2.3	7.4	11.0
Gross domestic investment	13.4	4.3	8.9	-1.7
Imports of goods and non-factor services	11.1	5.0	11.6	3.8
Gross national product	5.4	4.4	5.5	5.5



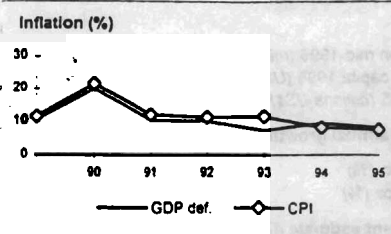
Note: 1995 data are preliminary estimates.

\* 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.

*Sri Lanka*

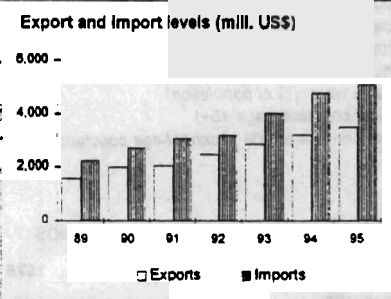
**PRICES and GOVERNMENT FINANCE**

	1975	1985	1994	1995
<b>Domestic prices</b>				
(% change)				
Consumer prices	6.6	1.5	8.4	7.7
Implicit GDP deflator	4.9	2.8	9.7	8.4
<b>Government finance</b>				
(% of GDP)				
Current revenue	..	22.0	18.9	20.6
Current budget balance	..	2.2	-3.0	-2.7
Overall surplus/deficit	..	-11.5	-10.5	-10.2



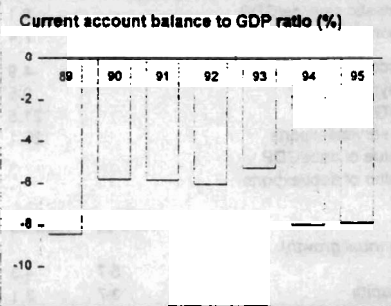
**TRADE**

	1975	1985	1994	1995
<b>(millions US\$)</b>				
Total exports (fob)	..	1,333	3,189	3,472
Tea	..	442	420	480
Other agricultural goods	..	94	278	348
Manufactures	..	233	2,131	2,613
Total imports (cif)	..	1,948	4,768	5,067
Food	..	217	589	717
Fuel and energy	..	404	296	387
Capital goods	..	382	1,358	1,187
Export price index (1987=100)	..	96	119	121
Import price index (1987=100)	..	86	148	155
Terms of trade (1987=100)	..	111	80	78



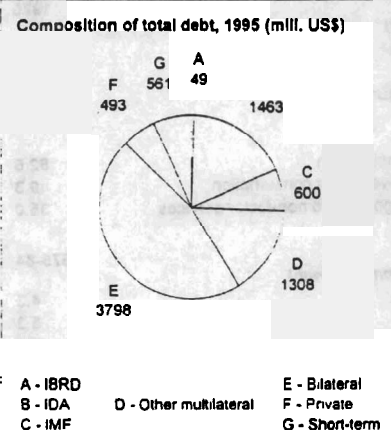
**BALANCE of PAYMENTS**

	1975	1985	1994	1995
<b>(millions US\$)</b>				
Exports of goods and non-factor services	632	1,561	3,944	4,841
Imports of goods and non-factor services	804	2,296	5,343	6,401
Resource balance	-172	-734	-1,399	-1,560
Net factor income	-18	-127	-161	-139
Net current transfers	3	266	627	679
Current account balance, before official transfers	-187	-596	-933	-1,020
Financing items (net)	161	481	1,282	845
Changes in net reserves	26	115	-349	175
<b>Memo:</b>				
Reserves including gold (mill. US\$)	57	472	2,035	2,107
Conversion rate (local/US\$)	7.0	27.2	49.4	51.3



**EXTERNAL DEBT and RESOURCE FLOWS**

	1975	1985	1994	1995
<b>(millions US\$)</b>				
Total debt outstanding and disbursed	815	3,540	7,811	8,272
IBRD	36	61	54	49
IDA	39	397	1,339	1,463
Total debt service	169	320	405	569
IBRD	6	9	13	12
IDA	0	3	16	18
Composition of net resource flows				
Official grants	56	151	160	155
Official creditors	61	297	289	278
Private creditors	-22	44	-66	-70
Foreign direct investment	0	26	166	195
Portfolio equity	0	0	112	29
World Bank program				
Commitments	30	137	0	39
Disbursements	19	79	78	106
Principal repayments	3	5	15	15
Net flows	16	74	63	91
Interest payments	3	8	15	16
Net transfers	14	66	48	75



Environmental Data Sheet for Projects  
in the IBRD/IDA Lending Program

Country: Sri Lanka	Project ID: LK-PA-10498 (IDA), LK-GE-39965 (GEF)
Project: Energy Services Delivery	IBRD Amount (\$m): \$0
Appraisal Date: 6/24/96	IDA Amount (\$m): \$24.2 (GEF \$5.9m)
Board Date: February 1997	Sector: Power
Managing Division: SA1EF	Status: Lending
Lending Instruments: FIL/SIL	Date Assigned: November, 1995
Date (est.) for receipt of EA by Bank (Category A Projects): N/A	
EA Category: B	
DATE DATA SHEET PREPARED/UPDATED:	
Prepared: May 15, 1996; Updated November 21, 1996	
MAJOR PROJECT COMPONENTS	
<ul style="list-style-type: none"> <li>• <u>Credit Program</u> to support renewable energy subprojects which are expected to be approximately: 21 run-of-river mini-hydro plants (average size 1 MW); 20 run-of-river village hydro systems (average size 15 kW); and 30,000 solar home systems</li> <li>• <u>Pilot Wind Farm</u> of approximately 3 MW</li> <li>• <u>Capacity Building</u> in renewable energy and demand side management</li> </ul>	
MAJOR ENVIRONMENTAL ISSUES:	
None	
OTHER ENVIRONMENTAL ISSUES:	
<p>The proposed project would have net positive effects on the environment. The off-grid electrification sub-projects (village hydro and solar home system) would reduce use of kerosene and lead-acid automotive batteries, thus benefiting the environment. No significant negative impacts are envisaged from the run-of-river village-hydro projects, as demonstrated by the 20 existing village hydro projects. Because of their small size and the fact that civil works are already in place, the grid-connected tea estate mini-hydro sub-projects also are unlikely to cause significant environmental damage; no resettlement is envisioned because the Project does not involve land acquisition. An environmental review for the Pilot Wind Farm has confirmed that it will have minimal environmental impacts, entails no resettlement or land acquisition, and would be located more than one mile outside the Bundala and Yala wildlife reserves.</p>	
PROPOSED ACTIONS:	
<p>As part of their credit applications, Credit Program subborrowers would be required to show evidence of environmental clearances from the Central Environment Authority (CEA), as necessary.</p> <p>The Ceylon Electricity Board (CEB) will be responsible for obtaining CEA clearances for the Pilot Wind Farm component.</p>	
JUSTIFICATION/RATIONALE FOR ENVIRONMENTAL CATEGORY:	
Operational Directive 4.0 specifically lists renewable energy projects in the "B" category.	
REPORTING SCHEDULE:	
<p>Category B: is there a separate environmental analysis? if yes, when is it due?</p> <p>N/A</p>	

REMARKS:

An environmental review for the Pilot Wind Farm was completed in September 1996.

Signature  
and Date:

*Per Ljung* 11/24/96  
Per Ljung, SOB  
Division Chief, SA1EF

Signature  
and Date:

*Maritta Koch-Weser*  
Maritta Koch-Weser  
Division Chief, ASTEN

Initials  
and Date:

*PL* 11/21/96  
Task Manager's Initials

Initials  
and Date:

*Maritta Koch-Weser* 11/26/96  
ASTEN Contact  
for EV.

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## Annex 13

### Sri Lanka: Energy Services Delivery (ESD) Project Incremental Costs and Global Environmental Benefits

#### Baseline

1. **Solar home systems and micro-hydro:** In Sri Lanka today, about 300,000 isolated rural households use kerosene lamps for lighting and automobile batteries for other energy needs, such as watching (black-and-white) TV sets. While these households have the potential resources to pay for grid-based electricity supply, this service is not available to them now, nor is it likely to be available to them in the medium term. Thus, the baseline course of action is that these households will continue to rely on fossil fuels for their energy needs.
2. **Wind Farm:** The CEB operates a central grid that includes both hydro and thermal facilities, and the expansion plan also includes both types of facilities. Since fossil-fired turbines and diesel power plants are the facilities at the margin, and the wind farm would displace generation from these plants, the baseline course of action is greater reliance on fossil fuels for power generation.
3. **Demand-side management:** Demand-side management initiatives lead to lower levels of electricity consumption than would occur in their absence. The baseline for this component is the DSM component that would have been implemented without the GEF-ESD project.

#### Global Environmental Objective

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

#### GEF Alternative

5. Under the ESD project, the GEF alternative to the baseline scenario is: (i) the sale and installation of about 30,000 solar home systems in Sri Lanka over a period of five years; (ii) the electrification of about 20 villages by village hydro schemes; (iii) the construction of a 3 MW pilot wind farm; and (iv) capacity building for energy efficiency in the commercial building sector through development of an energy efficiency building code of practice and associated training, design tools and incentives, and for enhanced monitoring of DSM impacts. Additional capacity building and support to off-grid subprojects (such as subproject preparation assistance, promotion and verification of design and installation, and operation of a consumer education and protection facility), which would contribute to the removal of market and institutional barriers to the adoption of solar home systems and village hydro, is included in the GEF alternative.

#### Additional Domestic Benefits

6. Apart from progress towards least-cost provision of electricity to rural consumers, the solar home system and micro hydro initiatives will reduce the exposure of household members to the smoke, pollution and dangers of fire/burns associated with kerosene lighting systems. The wind farm component will introduce Sri Lanka to an additional electricity generating resource option which is environmentally friendly. The demand-side management initiatives will lead to reduced building operating costs.