GEFM&E Terminal Evaluation Review Form

1. Project Data

			Review date:	8/1/2003
PROJ ID:	GEF ID 104		at endorsement	at completion
Project Name:	Energy Services Delivery (ESD)	GEF financing:	$5.90	$5.70
Country:	Sri Lanka	Co-financing:	$49.40	$38.90
Operational Program:	OP 6	Total Project Cost:	$55.30	$44.60
IA	World Bank	Dates		
Partners involved:	Renewable Energy Fund	Work Program date		4/1/1996
	Management Unit of the Ministry of	CEO Endorsement		2/10/1997
	Finance Government of Sri Lanka	Effectiveness/ Prodoc		7/22/1997
	(GOSL); Ceylon Electricity Board	Closing Date		12/31/2002
	(CEB), DFCC Bank (Adm. Unit)			
Prepared by:	Reviewed by:	Team Leader:	Team:	
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2. Project Objectives and Components as proposed and any changes during implementation

a. Global Environmental Objectives: To mitigate the impact of greenhouse gas (GHG) emissions by overcoming barriers to renewable energy and energy efficiency market development

b. Development Objectives: **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 Demand Side Management (DSM) implementation; and
3) Improve public and private sector performance to deliver energy services through renewable energy and DSM.

c. Expected outcomes: (Pro Doc) The primary direct project benefits are: a) the addition of about 26 MW of environmentally sustainable generating capacity, including a Pilot Wind Farm, grid-connected mini-hydros (GCMH), and electricity services to up to 32,000 rural customers through solar home systems (SHS) and off-grid village hydro (OGVH) schemes. b) development of sustainable markets for grid and off-grid renewable energy technologies. c) strengthening of demand side management and energy conservation capabilities within the CEB and the Sri Lankan architecture/engineering community. d) for the GEF eligible technologies (village hydro and solar home systems), benefits include the mitigation of greenhouse gas emissions through displacement of conventional technologies.

(Pro Doc) The primary programmatic benefits are: a) 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). b) acceptance by consumers, project developers and financial institutions of the viability of grid and off-grid renewable energy systems for electricity production and delivery. c) incorporation of DSM and energy efficiency measures in standard building design practices.

d. Outputs/ components/ activities: (Pro Doc) Note: there were no changes in these activities during implementation. **The Energy Services Delivery (ESD) Credit Component**, 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 GEF would be available for solar home system and village hydro subprojects. **The Pilot Grid-Connected Wind Farm Component** would finance a CEB-executed pilot grid-connected wind farm project of approximately 3 MW. This pilot project was 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. **The Capacity Building Component** would provide training and technical support for renewable energy and energy efficiency initiatives by both the public and private sector.

e. Comments on Project Cost, Financing and Dates: (TER) The GEF grant was used to partially fund all three project components. Of the US$5.9 million GEF grant, $200,000 were lost due to the devaluation of the World Bank's SDR currency (used in the legal agreements) against the US dollar. The cofinancing decreased from $49.4 to $38.9 million due to the following reasons: US$2.1 million of IDA funds were lost due to the devaluation of the World Bank's SDR currency against the US dollar, the PCIs decreased their contributions by US$8.9 million for several reasons including the adoption of more conservative gearing ratios, and CEB/GOSL also decreased their contributions by US$0.6 million. However, private entrepreneurs increased their investments by US$1.1 million to make up for the lower gearing ratios. There were a few delays in the implementation of activities. For example, the commissioning of the pilot wind farm was delayed 9 months but this had no impact on the project closing date.

3. Analysis of relations between (2.a) through (2.e) including assumptions and risks.

(TER) The relation between project objectives, expected outcomes and activities was sound and strong for the most part. However, more emphasis on DSM and energy efficiency was needed to mainstream them in standard building design and in end user practices. The risk analysis in the project document was detailed and sound measures were taken to reduce risks. The assumptions made were also sound.

4. Assessment of compliance with GEF review criteria

a. Implementation Approach: (TER) The project had a very strong logical framework and it was used during project implementation. (ICR) The project implemented innovative approaches that overcame the typical constraints of grid expansion and inefficiencies of a public sector approach. This project was designed to meet the need of small rural systems of below 5 MW capacity in parallel with an International Development Association (IDA) operation, the Private Sector Infrastructure Development Project, which was designed at the same time to support larger generation projects. The ESD credit program component has been central to the design of the project being the main channel to encourage private sector provision of energy services. As lack of access to long-term financing was the key barrier to private sector investments, the credit program design was appropriately targeted at meeting project objectives.

The credit program design, including on-lending arrangements were modeled after the successful Private Finance Development Project (PFDP). Some of the lessons adopted from the successes of the PFDP were (a) choice of direct on-lending to PCIs through an Administrative Unit (AU) arrangement rather than an on-lending arrangement through an Apex financial institution; and (b) project administration by a private entity (DFCC bank) on contract to the government. In addition, the onlending terms for PCIs and eventual borrowers reflected market conditions for the ESD project. Being part of an established finance institution, the AU started with the advantage of being familiar with the prevailing banking regulations and procedures. Its initial staffing was carried out in a manner that ensured adequate capacity to deal with the administration of the IDA credit and GEF grant.

(TER) The implementation approach was also responsive to unexpected situations through adaptive management. For example, to address the slow village hydro market development, an open solicitation process was initiated to get proposals from consultants on how to address policy, technical, and sustainability issues. As in the SHS component, the interventions resulted in the attainment of targets. Another successful example of proactive adaptive management was the project's involvement that resulted in acceptable tariffs for small hydro power projects. The project also adopted lessons from previous experiences as indicated in the Project Document.

b. Country ownership/driveness, and endorsement: (ICR) The project development objectives were consistent with the energy sector assistance outlined in the CAS. Specifically, three CAS objectives supported by the ESD Project were (i) environmentally sustainable energy development; (ii) promoting private sector delivery of energy services; and (iii) enhancing efficiency in the power sector. At the time of appraisal, public sector energy investments in Sri Lanka were inadequate to meet the rapidly growing demand. Energy shortages were causing almost daily power cuts in 1996 and this underscored the need for new generating capacity and improved efficiencies. Since a sizeable part of the population (about 48%) was without access to the grid, the possibility of their being served in the near future through the conventional system was nearly non-existent. This project therefore was prepared in response to the need for increased access to electricity in rural areas.

(TER) Other indications of strong country ownership are the government's financial commitment and the involvement of local credit institutions and entrepreneurs which contributed US$4.8 and US$10.7 million respectively. In addition, at project entry there was a pipeline of mini-hydro, village hydro, and solar home system projects totaling over US$ 58 million in project costs which had been identified for financing. Other indications of strong country driveness at project entry were that the operating guidelines for the credit program were in place, PCI eligibility criteria were established; the GOSL was in advanced stages of discussions with several PCIs. In addition, regarding the wind farm, the CEB had prepared the feasibility study and the bid package utilizing the IDA Project Preparation Facility (PPF) and CEB had also completed preparatory studies for DSM related work.

c. Stakeholder Participation/Public Involvement: (TER) The project had a sound approach to stakeholder participation which involved government local and national agencies, the private sector (financial and renewable energy investors), village associations, etc; and included renewable energy awareness, consultations, stakeholder participation, and capacity building resulting in implementation of demonstration projects. Several NGOs also took part in promotional and operational activities related to SHS and village hydro. (ICR) Broad community participation was evident from the fact that more than 30 villages requested assistance for preparing village hydro projects in the range of 1.5 to 60 kW under the GEF Project Preparation Advance (PPA). Regarding the participation of PCIs, the decision to use DFCC Bank as the administrative unit was taken by the government in consultation with the World Bank and other interested institutions. The use of one institution as both a PCI and the AU required the creation of a “Chinese wall” between the AU and the lending operations at the PCI. This prudent design was endorsed by the other PCIs.

d. Sustainability: (TER) The sustainability strategy of the project was very sound and strong. It included strengthening the financial sector to finance renewable energy projects, development of financial and economic instruments for the private sector, development of suitable organizational arrangements with the power utility, government and private sector, development of institutional capacity by training technicians, loan officers and power sector specialists, identification and involvement of champions including community associations and banks. Two areas needing improvement to enhance sustainability (and that the follow up, Renewable Energy for Rural Economic Development (RERED) project will pursue) are matching energy supply with demand for productive uses and strengthening the power sector policies which has been lagging behind in comparison to the growing use of renewable energy.

Some selected examples to illustrate the projects sustainability are: Solar companies such as Shell, Access, and Selco, have entered the market and helped trigger the take-off in sales and general improvement in after-sales service. They have brought international standards into play and much of their professional management is provided by Sri Lankan staff. An active Solar Industry Association (SIA) has come into being and is leading advocacy on industry concerns and renewable energy issues. Capacity to implement civil works, and manufacture smaller components for mini-hydro projects has developed locally. Private sector commercial banks and micro credit institutions are financing the RE projects and thus increasing the sustainability of the project outcomes.

e. Replication: (TER) The project's activities were oriented towards encouraging replication through a market transformation for renewable energy. As a result of the project activities the private sector has undertaken more renewable energy projects after the project closure. For example, about six serious private-sector mini-hydro developers now in operation are planning more sub-projects. Despite the low FIRR of the pilot wind-farm, it has generated considerable private sector interest in wind projects with 7-8 companies presenting unsolicited proposals to the CEB. As a result of this level of private sector interest, the CEB has recently issued a tender for development of a 22 MW wind-farm. Many of the hydro systems were transferred to the follow up RERED project. This follow up project was designed to capitalize on the momentum built by the ESD project drawing on its lessons. In addition, other financial institutions including commercial banks, leasing companies and MFIs have shown keen interest in renewable energy project financing (as demonstrated by a greater number of PCIs in the follow-up RERED project) given the success of the ESD.

(ICR) The ESD project has also generated private sector interest in the delivery of energy efficiency services. The first energy service company (ESCO) to be established in Sri Lanka is operating successfully with about 20 clients and more than 100 energy efficiency installations and at least 2-3 others are beginning operations. The project also provided capacity building and increased awareness about renewable energy projects among the provincial and central governments which resulted in further replication. For example, the AU helped a province design and implement a solar grant program under which 6000 SHS were installed. As a result other provinces have initiated similar programs.

f. Financial Planning: (ICR) Competent financial management and project management staff in both implementing agencies were enabling factors for successful project implementation. Accounting, record keeping, and reporting on project financial transactions (though manual) were timely, comprehensive and satisfactory. Noteworthy is DFCC Bank's financial management system for monitoring and disbursing against loan refinancing applications from PCIs, which is a good model to follow for future projects that have financial intermediation components. The existing financial management arrangements were augmented for the follow-up project.

(ICR) Regarding financial arrangements, under the credit program component, the Ministry of Finance and Planning (MOFP) would onlend project proceeds to eligible Participating Credit Institutions (PCIs) at the Average Weighted Deposit Rate (AWDR), which would in turn, onlend these proceeds, along with complementary financing out of their own resources, to eligible sub borrowers at market rates and terms. In addition to the IDA credit, the grant co-financing from the GEF was available through PCIs to developers of SHS and OGVH sub-projects to cover feasibility or business planning costs as well as for one time capital cost buydown. The program was to be administered based on a set of operating guidelines agreed by the GOSL and IDA. Grant funds were also available to the Administrative Unit (AU) for off-grid promotional efforts, verification and consumer protection activities.

(TER) The ICR included very detailed accounts of project costs by activity and calculations of economic rate of return (ERR) and the financial internal rate of return (FIRR). The actual FIRR for the grid-connected mini-hydro was 24%. The actual FIRR for the SHS was more than 20% without GEF financing. The actual FIRR for the village hydro (off-grid) could not be calculated due to lack of information but the estimated FIRR at appraisal was 22% and the ERR without GEF financing was 54%. These rates resulted attractive to the private sector and therefore, grant financing will be phased out in the follow up project as the private sector gets more involved. The FIRR for the wind farm was 0.9% given some miscalculations in the design of the turbines and that the final location had slower winds than appraised.

g. Cost Effectiveness: (TER) There was no information on the cost effectiveness of the project in the ICR and it is very difficult to estimate the cost effectiveness of the GEF grant given that it was used to fund portions of all the activities. To answer this question it has been said that the GEF needs to develop guidelines. Cost effectiveness decreases by the losses from the devaluation of the SDR. However, given that the project exceeded most of its targets, the likely sustainability of the project outcomes, the impacts in terms of GHG emissions reduced, and the market transformation and replication effects, it could be said that the project was cost effective.

h. Monitoring & Evaluation: (TER) The logical framework was used as an M&E tool. The M&E system was very robust allowing the project to adapt during implementation to better achieve the objectives. The project's achievements were measured against the initial conditions and the targets established during the project preparation. Very few targets were modified given unexpected delays but for the most part the project exceeded its original targets. The project also set up an M&E system with CEB to monitor the performance of the wind farm for decisions on future projects. In addition, the government set up an M&E system to monitor the impacts of the wind farm on bird populations and disruption of elephant migration paths to address the concerns raised by NGOs.

5. Significant Outcomes/Impacts and contribution towards the achievement of global environmental objectives:

GEO (ICR): The project will result in reducing carbon emissions by 514,000 tons (including the impact of mini-hydro projects) over the life of sub-projects, compared to the Project Appraisal Document (PAD) estimates of 140,000 tons (which excluded minihydro). (TER) It is not clear why the emissions from the minihydro component were excluded from the PAD.

DO1 (ICR)**:** The ESD project created an enabling environment for private sector participation in grid-connected renewable energy projects by facilitating development of a Small Power Purchase Agreement (SPPA) and by channeling long term credit through licensed commercial banks and licensed specialized banks. Private sector participation in off-grid renewable energy development was stimulated by the participation of Micro Finance Institutions (MFIs) in the credit program. In particular, participation of MFIs was instrumental in achieving increased penetration of solar home systems (SHS). The implementation of private sector renewable energy projects has created a vibrant industry of suppliers, developers, consultants and trainers.

Today there are 11 mini-hydro developers, 4 major solar companies and about 12-15 village hydro developers as compared to 1 mini-hydro developer, 2-3 fledgling solar dealers and 1-2 village hydro developers at project appraisal. In addition, at the village level, there are nearly 80 functioning electricity consumer associations. The pilot wind farm has generated considerable private sector interest and CEB recently launched a bid solicitation for a 22 MW wind power project. The collective experience has created a dynamic renewable energy industry with significant local expertise, minimizing the need for expatriate consultants. Having achieved success in the domestic market, Sri Lankan mini-hydro developers are now looking to overseas markets in Asia and Africa and local renewable energy consultants have began undertaking regional assignments to share their experience.

DO2 (ICR)**:** Through technical assistance support to the CEB and the private sector stakeholders, the project has also strengthened the environment for the implementation of DSM projects as well as built private sector capacity in the delivery of energy efficiency and renewable energy services. Completion of the first national load research program under the project is notable in this regard as it helped in identification of impacts of different classes of consumers and appliances on the system peak demand (details available at website http://www.ceb.lk). Evaluation of the ongoing energy efficient lighting program helped CEB build capacity in the area of DSM program evaluation. The associated technical training also helped refine CEB's audit programs. During the course of the project, CEB also led the preparation and issuance of energy efficiency building codes for voluntary adoption by architects, builders and property developers.

DO3 (ICR)**:** The first Energy Service Company (ESCO), initially established as a division within Lanka Transformers Limited (LTL), also came into being benefiting from the capacity building efforts under the project. Following-up on the success of this company, 2-3 new companies are also now providing energy efficiency services. The pre-electrification unit at the CEB helped increase awareness and build renewable energy project implementation capacity in its area offices as well as private sector and NGOs through regular training programs.

6. Significant Shortcomings (including non-compliance with GEF policies and procedures):

GEO: (TER) The project did not emphasize the integration of rural electrification projects into productive uses to achieve economic development. This has a considerable negative impact on the poorest sectors because the project benefits were skewed towards middle to upper income rural people as these are the groups that have the highest willingness and ability to pay. In addition, the GHG contribution from the poorest sectors may be considerable as well. This issue has been identified as a weakness that the follow up RERED project is supposed to address.

DO1: (TER) The project should have made a better attempt to calculate the FIRR for the village hydro and SHSs since this information is paramount to attract more private sector investors. The CEB was aggressively pursuing thermal power capacity additions as indicated in the project document. It is not clear why the project did not explore that option as well in its portfolio of renewable energy alternatives.

DO3: (TER) The project did not place enough emphasis on power sector restructuring and the development of national policies to further promote the project's initiatives (effective reform and regulation) but the follow up project will do so.

Other: (ICR) The ethnic conflicts in the Northern and Eastern part of the country affected the market for RE technologies, specially SHSs and reduced the long term capital available for the financial sector.

7. Ratings

	IA Terminal Evaluation	Other IA evaluations if applicable	GEF M&E	Comments
Implementation Approach	Not available	Not available	Highly Satisfactory	Refer to 4.a
Stakeholder Participation/Public Involvement	Not available	Not available	Satisfactory	More DSM and EE outcomes required
Sustainability	Likely	Likely	Satisfactory	Refer to 4.d
Monitoring & Evaluation	Not available	Not available	Satisfactory	Refer to 4.h
Quality of the TE		Satisfactory	Satisfactory	
Outcome of major objectives	Satisfactory	Satisfactory	Satisfactory	Refer to 2 a. b., 5 and 6

Ratings: Highly Satisfactory, Satisfactory, Marginally Unsatisfactory, Unsatisfactory, and N/A.

8. Lessons and recommendations for on-going and future GEF projects

(ICR and TER) The success of ESD project interventions can be ascribed to their being demand driven and commercially oriented, while enabling and empowering appropriate stakeholders to overcome technical, financial and institutional barriers. The following lessons have been identified for embarking on a successful private sector led (renewable) energy intervention: **1. Improve access to capital.** One of the key barriers for energy investments is access to capital. Private entrepreneurs seeking to sell power to the grid need long term loans that fit their cash flows. Villages Electricity Consumer Societies (using OGVHs) and individual households (using SHS) needed loans to make the energy systems more affordable. The project addressed these needs through a **credit program** and an **output focused co-financing grant.**

Credit Program: Microfinance institutions as credit institutions play a significant role in small and medium enterprises development because they make system more affordable and open new markets for retailers. In addition, they are more suited for financing rural energy service provision than commercial banks or SHS vendors because given the additional costs, expertise needed and risks involved, the credit service should be handled by smaller specialist organizations.

Output focused co-financing grants: They provide incentives for private companies to enter new markets and deliver pre-defined products because they provide grants to cover some of the incremental cost for the introduction of environmentally friendly technologies. These grants were output focused and only disbursed after the pre-defined results were achieved.

2. Build an enabling business and policy environment. After key barriers were addressed, investors were willing to take on larger projects and new companies were willing to enter the market. Some specific lessons are:

· For a private sector led program to succeed institutional structures must be effective and policy frameworks must be conducive. For example, making sure renewable energy can compete with other technologies on a level playing field by reducing or eliminating import duties for renewables, and creating small power purchase agreement (SPPA) frameworks, rural electrification policies and national electricity reform legislation.

· The implementation of a standardized power purchase agreement using a formula-based way of determining the least cost tariff should be ensured to reduce overhead costs associated with having to negotiate every small power project.
· Business associations (e.g., Small power producers association, Solar industry association, Village hydro association, Village hydro consumers association and Biomass association) should be properly involved because they improve impacts, and promote the building of constituencies that improve the business environment (e.g., by discussing a standardized SPPA and tariffs with the national utility and relevant ministry, requesting CEB rural electrification expansion plans, engaging provincial governments in off-grid electrification concepts, harmonizing the government's energy policies, addressing technical and financing issues, and resolving service delivery issues).

3. Scale-up capacity building initiatives. This and other projects such as the India Renewable Resources Development Project demonstrated that it is essential to provide training to enhance the capacity of the private sector, government agencies, NGOs, and other stakeholders on the technologies, credit operations, implementation and monitoring of projects. It may require two to three years to build the framework, therefore perseverance is essential. After the market transformation begins and a critical mass of institutions, private entities and associations are involved, the capacity building process accelerates and up-scaling becomes easier and cheaper. A project by project approach to provide capacity building for technicians may slow the market transformation process for village hydro and SHS. A better approach, specially in a growing market may be to provide training for large numbers of installers of SHS and integrate courses in regular curricula. In addition, education of end users is essential as most technical problems encountered with SHS and mini hydro systems were related to improper use of the systems.

4. Use market principles when considering the introduction of new systems and technologies. The introduction of new technologies needs to be driven by a sound economic rationale and market principles, such as for example, the system needs to be the least-cost option compared to alternatives, and the incremental cost of the systems needs to be in-line with the incremental cost globally and have a declining trend. In addition, reliable after-sales service should be in place to increase consumers confidence and the sustainability of the outcomes.

5. Renewable energy market analyses must include both sides, supply and demand. Three main lessons are of note:
· The study found that end users are willing to pay more than their current energy expenditures as long as the energy supply is more reliable and safer (i.e., health and other risks associated with the use of kerosene for lighting).
· Local participation and cash contributions for the implementation and monitoring of off-grid projects is a crucial element to project success as it increases community ownership, improves local capacities, strengthens community relations, and promotes a culture of payment that facilitates costs recovery.
· Middle to upper income rural people benefit most as the technologies involved are not cheap, and these are the groups that have the highest willingness and ability to pay.

9. Is a Post Completion Evaluation/Impact Evaluation recommended? (Yes or No)

Yes. THIS PROJECT PROVIDES LESSONS THAT SHOULD BE CONSIDERED BEST PRACTICES FOR RENEWABLE ENERGY ELECTRIFICATION. Note that OED has also recommended an audit of this project.

10. Comments on the quality of Terminal Evaluation according to the attached checklist

The quality of the TER was high. It provided a detailed assessment of the project outcomes although it downplayed the project shortcomings such as the failure to focus on the development of a strong national renewable energy policy framework which had to be inferred from the information presented. The criteria for the selection of one renewable energy technology over another was not discussed in the ICR, which makes it difficult to assess the optimization of resources. The ICR did not include what percentage of the national energy supply was provided by the project's renewable energy initiatives. The project took some very strong steps in the right direction in terms of DSM and energy conservation, however the impacts of these on peak demand were not discussed in the ICR (i.e. how much has peak demand decreased thanks to the DSM and energy conservation project efforts?). The website www.ceb.lk provides some good insights but more emphasis should be given to energy conservation in the follow up project. A discussion of the negative impacts (i.e. environmental, waterborne pests, etc.), if any, or environmental impact assessments (if needed) for the small hydro projects Vs. the benefits was not discussed in the ICR.

TERMINAL EVALUATION QUALITY CHECK LIST

	Question	Yes/No	Comment
1	Have all parts of the Terms of Reference been addressed?	N/A	The TOR were not available.
2	Does the main report, plus any Annexes, comply with the GEF Guidelines for Terminal Evaluation, including an assessment of the 8 GEF criteria and the requested ratings?	Yes	There was enough information in the ICR to answer the 8 GEF criteria
3	Does the report contain a comprehensive executive summary?	No	No executive summary per se but a good summary of achievements at the beginning
4	Is the evaluation methodology described and adequate?	No	
5	Have all the major stakeholders been consulted and their views reflected in the report?		The views of all stakeholders were not reflected in the report but the report indicates that they were properly involved in the project.
6	Have all the major documents been reviewed and their contents adequately reflected in the report?	Yes	
7	Are the statements presented in the report substantiated?	Absolutely	
8	Are the conclusions/lessons supported by the evidence presented?	Yes	
9	Does the report include the actual project costs (total and per activity) and actual co-financing used?	Yes	
10	Does the report contain an assessment of all relevant results and impacts of the project?	Yes	
11	Is the terminal evaluation/ICR team independent from the project?	No	
12	Do the IA/EA and the GEF grant recipient agree with the findings of the terminal evaluation?	Yes	
13	Has dissemination of the report ensured that the findings are accessible to all the major stakeholders and to the accountable parties?		Not able to make an assessment
14	Is the role of the GEF adequately presented in the report?	Yes	