ICR Review

Operations Evaluation Department

Report Number : ICRR11529

1. Project Data:		Date Posted : 06/24/2003		
PROJ ID : P010498			Appraisal	Actual
Project Name : Energy Services Delivery		Project Costs (US$M)	55.3	44.6
Country : Sri Lanka		Loan/Credit (US$M)	24.2	22.1
Sector(s): Board: EMT - Renewable energy (96%), Power (4%)		Cofinancing (US$M)	GEF: 5.9 Participating Credit Institutions: 13.7 Entrepreneurs: 9.6 CEB/GOSL: 1.9	GEF: 5.7 Participating Credit Institutions: 4.8 Entrepreneurs:10.7 CEB/GOSL: 1.3
L/C Number : C2938; CP949				
		Board Approval (FY)		97
Partners involved :		Closing Date	12/31/2002	12/31/2002

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2. Project Objectives and Components

a. Objectives

The project had four objectives, including a global environment objective :

1. Promote the provision by the private sector, NGOs, and cooperatives of grid -connected and off-grid connected energy services using environmentally sustainable renewable energy technologies;
2. Strengthen the environment for demand-side management (DSM) implementation;
3. Improve public and private sector performance to deliver energy services through renewable energy and DSM; and
4. Global Development Objective: to mitigate the impact of Green House Gas (GHG) emissions by overcoming barriers to renewable energy and energy efficiency market development .

b. Components

The project had three components:

1. **An Energy Services Delivery (ESD) Credit Line Component (US$ 38.4 million or 86% of total actual project costs)**, onlent through eligible Participating Credit Institutions (PCIs), to provide support for medium and long-term financing to private sector firms, NGOs and cooperatives for solar home systems (SHS; US$ 9.2 million), off-grid village hydro (OGVH; US$ 0.8 million) projects, grid-connected mini-hydro (GCMH; US$ 26.7 million) projects, and other renewable energy investments (primarily, technical assistance for 'business development' and 'off -grid project support'; US$ 1.7 million). The Global Environment Facility (GEF) grant co-financing would be available through PCIs to developers of SHS and OGVH subprojects to cover feasibility or business planning costs as well as for a one -time capital cost buydown. GEF grant funds were also available to the Administrative Unit (AU) (responsible for administering the Credit Line Component) for off-grid promotional efforts, verification and consumer protection activities.
2. **A Pilot Grid -Connected Wind Farm Component (US$ 3.8 million or 9% of total actual project costs)**, intended to pilot the feasibility of small-scale wind power generation projects in Sri Lanka from a technical and commercial standpoint. The component would finance a grid-connected 3-MW pilot wind farm project executed by the Ceylon Electricity Board (CEB) on an Engineering, Procurement, and Construction (EPC) contract basis, subject to standard IDA procurement procedures. CEB, however, would be responsible for facility monitoring, operation, and maintenance, including all potential operation and/or service contracts.
3. **A Capacity Building Component (US$ 2.3 million or 5% of total actual project costs)**, which provided training and technical support in the area of renewable energy and energy efficiency for the different stakeholders and implementing entities in the public and private sector. CEB's DSM Cell and Pre-Electrification Units (PEU) would implement the capacity building component.

Revised Components :

Project components were not revised. However, the target underlying the SHS sub-component was revised at mid-term, from serving 32,000 off-grid households to serving 15,000 households, due to the slow market development in the initial stages of the project.

c. Comments on Project Cost, Financing and Dates

Total project cost was US$ 44.6 million compared to the appraisal estimate of US$ 55.3 million.

- Contributions from PCIs were US$4.8 million compared to the appraisal estimate of US$ 13.7 million, as a result of three factors: (1) the increase in the amount of IDA refinance from 60% to 80%, (2) the lower than expected US$ per kW investment costs for both GCMH and OGVH projects, and (3) PCIs adopting more conservative gearing ratios than estimated at appraisal (of about 65:35 versus the 80:20 originally planned) to minimize the financial risk of investment projects. Partly in response to these factors, contributions from entrepreneurs exceeded the US$ 9.6 million estimated at appraisal by US$ 1.1 million.
- The project closed on the original date, 12/31/2002.

3. Achievement of Relevant Objectives:

1. Promote the provision by the private sector, NGOs, and cooperatives of grid -connected and off -grid connected energy services using environmentally sustainable renewable energy technologies : *This objective was substantially achieved.*The project assisted in the development of a growing private sector renewable energy industry of suppliers, developers, consultants and trainers. Through flexible, consultative and iterative project design and implementation, it employed a range and mix of different methods and approaches that seemed to learn from the positive and negative experiences of similar projects elsewhere (e.g. India and Indonesia) and which seemed suitable to both grid-based and off-grid energy service delivery: a direct on-lending approach to financing, including both commercial banks and MFIs, as well as output-focused co-financing grant programs, suitable to both grid-based and off-grid service delivery; as well as a mix of public/Engineer, Procure and Construct (Wind Farms), private/retail-driven (GCMH/SHS), and community-driven (OGVH) approaches.

In terms of capacity outputs, the project did well on average. Both the GCMH and OGVH subcomponents exceeded their respective capacity targets, although a lower number of households were served by the OGVH subcomponents than anticipated at appraisal (1,732 households compared with the 2,000 estimated by the PAD) due to possible underestimation of household demand. Due to the slow market development of the SHS subcomponent in the initial stages of the project, the project failed to meet its original target of serving 32,000 households though it ultimately ended up exceeding the revised target of 15,000 SHS installations (revised at mid-term) by almost 6,000. The Wind Farm component achieved its physical capacity target of 3 MW, although the EIRR achieved was significantly below that estimated at appraisal (3.9%, incl. GEF, as compared with 14% at appraisal) due to substantiantially lower than anticipated capacity factors, putting into question the future commercialization of wind -generated energy in Sri Lanka.

2. Strengthen the environment for demand -side management (DSM) implementation : *This objective was partially achieved.*During the course of the project, the main output target - the preparation and issuance of energy efficiency building codes for voluntary adoption by architects, builders and property developers - was fully achieved. Above and beyond references to these *outputs*, the ICR provided little evidence on the *outcome* of the project in terms of increased energy efficiency.

3. Improve public and private sector performance to deliver energy services through renewable energy and DSM. *This objective was substantially achieved.*The project was highly instrumental in reducing the financial bottleneck for renewable energy investments, and the capacity -building elements of the project helped develop local - both public and private sector - expertise and capacity in DSM and renewable energy technologies and service provision.

4. Global Development Objective : to mitigate the impact of Green House Gas (GHG) emissions by overcoming barriers to renewable energy and energy efficiency market development . *This objective was fully achieved.* The global environmental impact of the project was beneficial (carbon emissions were reduced by some 514,000 tons).

4. Significant Outcomes/Impacts:

- The project was relatively successful in levelling the playing field (through SHS import-tariff rationalization) and in reducing regulatory uncertainty (through standardizing "Small Power Purchase Agreements") for renewable energy investments. High quality at entry by the Bank as well as significant government ownership and commitment to the project promoted an enabling environment for renewable energy investments.
- The economic rates of return for GCMH, OGVH, and SHS (though not for Wind Farms) exceeded those estimated by the PAD, even, in most cases, when excluding GEF financing.

5. Significant Shortcomings (including non-compliance with safeguard policies):

- The lagging nature of broader sector reform is a continuing obstacle to providing an enabling environment for DSM and energy efficiency as well as for improved public and private sector performance more generally (incl. corporatization, commercialization, tariff rationalization, and establishment of an independent regulatory body), which should have been addressed more explicitly by the project. The absence of such a policy and regulatory framework conducive to DSM, renewable energy and off-grid provision continues to put the future viability of the project and the associated investments at risk.
- The project also did not live up to its potential in terms of promoting off-grid access and, hence, helping the poor

directly. Whilst it is an improvement in this regard compared with similar projects elsewhere (eg. India), the main focus of the project, in terms of project costs, was on increasing generating capacity of grid-based service provision to the relative neglect of SHS and OGVH. Moreover the project fell short of its original targets for SHS installations. Furthermore, given that access to electricity through SHS and OGVH was based primarily on a willingness and ability to pay, it benefited mostly middle to upper income rural households to the relative neglect of the poorer segments of society. A more 'holistic' approach to servicing the energy and economic development needs of rural populations is needed which better ties energy services to local capacity-building, income generating activities, as well as to the provision of basic services such as health and education.

- As regards the Global Development Objective, it was difficult to assess the actual outcome, as the assumptions underlying the estimations used by the ICR did not correspond with those of the PAD; in the former, calculations included the GHG emissions displaced by the small-hydro sub-components, whilst in the latter, calculations excluded the GHG emissions displaced by the small-hydro sub-components as these did not receive GEF grant co-financing. The ICR did not devote sufficient attention to this objective, or to providing the underlying evidence supposed to sustain its ratings.
- To the credit of the project team, however, some of these shortcomings - the lack of both a sector- and poverty-oriented focus - have been addressed more explicitly in the follow-on project - Renewable Energy for Rural Economic Development (RERED).

6. Ratings:	ICR	OED Review	Reason for Disagreement /Comments
Outcome:	Satisfactory	Satisfactory	As noted earlier, whilst the renewable energy components of the project were quite successful, the end-use energy efficiency and DSM components were found to be lacking.
Institutional Dev .:	High	High	The ICR failed to discuss the potential conflicts of interests (as well as the potential measures put in place to reduce them) of having a PCI (the DFCC) also house the Administrative Unit of the Credit-line Program.
Sustainability:	Likely	Likely	It should be noted, however, that as many of the investments are relatively recent, it may be too early to adequately assess the sustainability of the project. Also, the AU/PCI conflict of interest noted under "Institutional Development Impact" could undermine future benefits unless resolved. Lagging power sector reforms, as noted earlier, pose additional risks.
Bank Performance:	Satisfactory	Satisfactory	The Borrower recommends that the rating of Bank performance be upgraded to "Highly Satisfactory", as the "participatory and proactive role" of the Bank paved "the way for the rapid market take-off" for off-grid systems.
Borrower Perf .:	Highly Satisfactory	Highly Satisfactory	
Quality of ICR:		Satisfactory	

NOTE: ICR rating values flagged with ' * ' don't comply with OP/BP 13.55, but are listed for completeness.

7. Lessons of Broad Applicability:

1. Overcoming the barriers to access to finance is crucial for renewable energy investments in general, but specifically those targeted at rural, remote and off-grid areas. For private entrepreneurs the need is often for longer term loans that better fit their respective risk profiles as well as the cash flow requirements of renewable energy investments (high initial costs, relatively long repayment periods). For rural households and villages, the need is for loans that make (renewable) energy systems more affordable.
2. A conducive and credible policy and regulatory framework is paramount for the success and future commercialization of renewable energy investments, as well as off-grid and poverty-oriented energy service delivery systems more generally.
3. Allowing for flexibility, innovation and participation in project design and implementation (i.e. a consultative and iterative 'continuum of options' approach) is of great importance when attempting to overcome the range of problems associated with renewable energy and off-grid developments (access to finance, market development issues,

servicing, monitoring, etc). A willingness to pursue a range of different alternatives (i.e. public, private, NGO involvement, retail-driven as well as community-driven approaches, commercial banks as well as MFIs) seems apt to fit the different needs and contexts of renewable energy demand in developing countries.

8. Assessment Recommended? ● Yes ○ No

Why?

- The project provides useful insights into the changing nature of Bank approaches to renewable energy promotion, encompassing both grid-based and off-grid based approaches, innovative financing models, as well as retailer- and community-driven approaches. The shifting emphasis of the Bank towards more directly targeting poverty reduction is also evident in this project, making it, overall, a suitable candidate for an audit from which broader lessons learned can be derived.
- Many lessons may also be learned from the Bank's role in this project, which the borrower considers as highly satisfactory, that could inform the implementation of the Bank's renewed support for infrastructure.
- Possibly an audit could be clustered with the completed Power Distribution and Transmission Project (2), where issues of access and energy efficiency are of import.

9. Comments on Quality of ICR:

The quality of the ICR was satisfactory. It is internally consistent, and the content provided is generally of a very high quality, though a range of presentational errors undermine the overall impression. More information should have been included on the state of power sector reforms in Sri Lanka more generally. The ICR also would have benefited from additional information on GHG emissions, as well as from improved FIRR estimates which could better assist private investors in accurately assessing financial risks.