

GEF EO Terminal Evaluation Review Form

1. PROJECT DATA				
GEF Project ID: 595		Review date:		Dec 22, 2007
IA/EA Project ID: 502227 IBRD		<u>at endorsement</u>		<u>at completion</u>
Project Name: Solar Development Group (SDG)		<u>(Million US\$)</u>		<u>(Million US\$)</u>
Country: Global		GEF financing:	10.0	1.3
		IA/EA own:	5.5	
		Government:	0.0	0.0
		Other*:	13.3	
		Total Cofinancing	18.8	2.3
Operational Program: OP6 Renewable Energy		Total Project Cost:	28.8	3.9
IA	WB	<u>Dates</u>		
Partners involved:	IFC Triodos PV Partners (TPVP)	Work Program date		September, 1998
		CEO Endorsement		July 18, 2000
		Effectiveness/ Prodoc Signature (i.e. date project began)		March, 2001
		Closing Date	Proposed: March 2011	Actual: June 2004
Prepared by: Alejandro Imbach	Reviewed by:	Duration between effectiveness date and original closing: 10 years	Duration between effectiveness date and actual closing: 3 years	Difference between original and actual closing: NA
Author of TE: Enterprising Solutions Global Consulting		TE completion date: April 20, 2006	TE submission date to GEF OME: June 2007	Difference between TE completion and submission date: 14 months

* Other is referred to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

2. SUMMARY OF PROJECT RATINGS

Please refer to document "GEF Office of Evaluation Guidelines for the verification and review of terminal evaluations" for further definitions of the ratings.

	Last PIR*	IA Terminal Evaluation	Other IA evaluations if applicable (e.g. IEG)	GEF EO
2.1 Project outcomes	S	HU	NA	HU
2.2 Project sustainability	N/A	HU	NA	U
2.3 Monitoring and evaluation	---	Not Rated	NA	UA
2.4 Quality of the evaluation report	N/A	N/A	N/A	MS

* No PIR reports available.

** IFC/GEF Project Supervision Report

Should this terminal evaluation report be considered a good practice? Why?

Partially. While it is internally consistent, the evidence is convincing and it develops a well structured context analysis to support the lessons learned, the analysis of the M&E System and the Projects costs are weak.

Is there a follow up issue mentioned in the TE such as corruption, reallocation of GEF funds, etc.? No

3. PROJECT OBJECTIVES AND ACTUAL OUTCOMES

3.1 Project Objectives

- **What were the Global Environmental Objectives of the project? Were there any changes during implementation?**

According to the Logframe of the Project Document (PAD), the Project Global Environment Objective was: "Greenhouse gas emissions reductions via removal of barriers to purchase and use of PV (photo-voltaic) applications in rural electrification".

As reported in the PIRs and the TE, this Objective was maintained without changes during implementation.

- **What were the Development Objectives of the project? Were there any changes during implementation?**

According to the Logframe of the Project Document (PAD), the Project Development Objective was: Accelerate the development of viable, private-sector business activity in the distribution, retail and financing of off-grid PV applications in developing countries.

As reported in the PIRs and the TE, this Objective was maintained without changes during implementation.

3.2 Outcomes and Impacts

- **What major project outcomes and impacts are described in the TE?**

Not major project outcomes or impacts described, as they were not achieved (see next items).

4. GEF EVALUATION OFFICE ASSESSMENT

4.1.1 Outcomes (use a six point scale 6= HS to 1 = HU)

A Relevance

Rating: MS

Consistency with focal areas / operational program strategies:

The expected Outcomes were consistent with the Focal Area strategies and relevant to GEF. The actual outcomes were negligible as few unit sales were attributable to SDC investments. It is important to note, however, that the use of PV technology in rural off-grid households is not an effective way to combat CO₂ emissions, given that such populations are low-level producers of CO₂ in the first place.

B Effectiveness

Rating: HU

Outcome / Achievements of objectives (HS). (Part 3.4 of the TE report).

The achievements of the Fund were very limited. The Fund invested only US\$650,000, which has resulted in the installation of very few additional SHS (solar home-systems), if any, compared to the number that would have been installed without the Fund.

Consequently, it had very little impact on the development of local businesses and on the environment (CO₂ emissions and other pollutants). Further, it did not contribute to building an enabling environment.

C Efficiency (cost-effectiveness)

Rating: HU

Cost - effectiveness (Part 3.3.2 of the TE report).

Upon the termination of the Fund in mid-2004, \$3.6 million had been called and disbursed. From this amount, approximately \$2.1 million (58 percent) had been allocated to management fees, \$330,000 to expenses, and \$1.2 million to deals and deal-related expenses. Operating costs were consistently less than the original ten-year projections but approximately equal to the yearly projections. All together, the Fund spent \$3.6 million to disburse \$650,000, a ratio of 5.5:1. This does not include the cost of the BDS and pipeline services provided by SDF, nor the IFC or World Bank costs related to the project. IFC costs related to the project were unavailable but if a conservative estimate considers them to be half of the GEF costs, the expense to disbursement ratio increases to 6.75:1. Oversight costs incurred by the various shareholders would increase the ratio.

An internal IFC review of management fees and expenses found that the fund managers "operated very frugally and were at best covering, costs, particularly given the wide reach of the operations and the rigorous due diligence conducted." (OEG Initial Project Evaluation Summary, 2005).

The cost of the SDC venture to the GEF is estimated to approximately \$1.79 million. Out of this, \$1.27 million was disbursed to SDC, and \$0.52 million was used for operational costs (e.g., time of investments officers, transportation costs) linked to the SDC investment (Financial analysis team of the CES-

Environment & Social Development Department, IFC, September 2005.)

SDC compared to its peers (Part 3.3.3 of the TE report). The TE compares some features of the main global investors in solar energy in terms of nature of investors and investments:

Nature of Investors

Funds. Based on an informal survey, corroborated by Phil LaRocco of E+Co (which tracks much of this information and was itself involved in a number of the funds), six global investment funds invested in solar energy in LDCs in the last decade. Three were dedicated to solar energy specifically, and three were dedicated to renewable and/or clean energy, including PV solar. The World Bank Group (through GEF and IFC) was involved as a lead investor in all but one. Notably, none of these investors were purely commercial, although SDC had a clear for-profit objective. Each of the funds started between 1994 and 2001. SDC and SDF were the last to begin. SDC was closed just two years after it began. REEF was restructured.

Distributors. Only two distributors are present on a global scale – BP Solar and Shell Solar – although BP Solar focuses more on manufacturing than on distribution. Both benefited from the significant investment potential of their parent companies and have been working in the sector for over 30 years. A third distributor, SELCO, has developed a distribution network in three countries (India, Vietnam, and Sri Lanka). (Information on SELCO, Shell Solar, and BP Solar were provided by the practitioners interviewed). Each of these companies have only begun to become profitable in recent years, although their profitability has been affected by Northern growth in demand for PV that has resulted in supply shortages and price increases in emerging markets. Shell Solar reports that its operations are just breaking even. Considering the relatively “deep pockets” and the long experience of both BP and Shell Solar, in particular, and the fact that neither works exclusively in off-grid rural areas, their experiences underscore the complex challenge of achieving profitability in the PV solar sector.

Other investors. Interestingly, although regional development banks were not active in financing solar energy projects during the last decade, they now seem to have developed some interest in the industry. In 2005, each announced that it would finance one solar project in their respective region:

- The Asian Development Bank announced that it will help develop solar energy technologies in isolated rural areas of Afghanistan, through a technical assistance grant approved for US\$750,000. The grant is from the Poverty Reduction Cooperation Fund, financed by the UK government. (Asian Development Bank website)
- The Inter-American Development Bank announced the approval of \$700,000 in financing to support a project that will provide solar-powered electricity systems to isolated rural communities in Nicaragua. The financing includes a \$520,000 loan and an \$180,000 grant to TECNOSOL, a Nicaraguan firm specializing in electricity generation systems powered by wind, water and solar energy. (Inter-American Development Bank website)
- The African Development Bank announced the financing of a Solar Thermal Power Station Project. It seeks to extend electric power generation facilities and develop renewable forms of energy in Morocco. The project is co financed by the GEF. (African Development Bank website)

In some cases, local and national authorities also helped finance solar energy projects.

Investments

The amount committed for the PV solar funds ranged from \$13 to \$65 million, and the total amounts invested were between \$650,000 (SDC) and \$5 million. Notably, all funds had difficulty identifying potential investments, and therefore were able to disburse only a small percentage of their total committed capital. The number of solar energy companies financed by each Fund ranged from one (REEF) to ten (E+Co), with the exception of SDF which was a technical assistance fund and not commercial in nature, which financed 46.

Profitability. SDC was not the only fund that suffered significant losses. Most of the other World Bank Group investment funds did as well. All together, the solar energy investments were at best recovering their funds:

- All investment funds except one (E+Co) had significant losses. E+Co experienced a wide range of returns from one investment to another, from loss of 50 percent of capital to a peak of an 11

- percent return on one investment.
- Shell in Asia and BP Solar globally were just breaking even after 30 years of existence and heavy investments.
- SELCO India was profitable from 2001 to 2004 and will make losses in 2005 because of supply delays that resulted in cash flow issues and price increases (the price of their systems increased by 20 percent in recent years).

It seems that the longer the investor was in business, the more successful it was (Shell, BP, and E+Co are the most successful and the oldest investors). Both E+Co and Shell emphasized the importance of learning by doing as a key factor of success in this still nascent industry. But as we have seen, none have been overwhelmingly successful.

4.1.2 Impacts

The project has not achieved significant outcomes or impacts. Part 3 of the PE report states:

CO2 emissions. The effect of SDC's investment activities on CO2 emissions was negligible as few unit sales were attributable to SDC investments.

Growth of the sector. For the most part, SDC's work with individual businesses met with limited success. In the case of Indonesia, SDC took a more comprehensive strategic approach, working with two PV manufacturers, supporting financing system through a local bank, as well as working with a local alternative energy consultancy. Unfortunately, the Fund was closed before the results of the regional sector-building strategy could show results.

Use of PV Systems. SDC had a very limited impact on the level of use of PV technology, and especially of off-grid solar home systems in developing countries. As only three SDC investments were made, only a few systems were installed. The number of systems installed in Indonesia was negligible as the project was shut down shortly after start-up. Because the Kenyan investee is bankrupt, documentation on how the number of systems installed or maintained by other firms subsequent to the bankruptcy is unavailable. The Bolivian company continues to install SHS but in recent years, with only part of the SDC investment to help build the firm's SHS market. Close to 80 percent of the firm's income has come from installations in businesses in the technology field.

Information dissemination and awareness. The most positive outcome of SDC may be that it provided important lessons for the industry and for stakeholders. For example, taking the lessons learned from its SDG experience, the Triodos Renewable Energy for Development Fund, which took over SDG's portfolio, decided to drastically change its investment strategy.

4.2 Likelihood of sustainability. Using the following sustainability criteria, include an assessment of **risks** to sustainability of project outcomes and impacts based on the information presented in the TE. Use a four point scale (4= no or negligible risk to 1= High risk)

A Financial resources	Rating: U
TE report describes risks associated to macroeconomic issues and markets, financial returns, nature of the business model, and capital availability.	
B Socio political	Rating: ML
TE report describe risks related to knowledge base of consumers,	
C Institutional framework and governance	Rating: U
Risks related to knowledge base of suppliers, barriers to product acceptance, and government policies.	
D Environmental	Rating: L
No environmental risks.	

4.3 Catalytic role

a. Production of a public good.	The TE does not address this issue. It is not possible to assess it directly because the project products were not achieved.
b. Demonstration.	Not applicable
c. Replication	Not applicable
d. Scaling up	Not applicable

4.4 Assessment of the project's monitoring and evaluation system based on the information in the TE

A. M&E design at Entry	Rating (six point scale): HU
The Project Document does not include an M&E system. It just mentions that one is being developed: <i>"An SDG Monitoring, Evaluation, and Dissemination plan is under development between the SDG Manager and the World Bank Group and it will include adequate mechanisms to ensure compliance with the plan. Monitoring and evaluation will be performed on an ex-post basis using available guidelines for World Bank/GEF climate change mitigation projects. This will include an independent evaluation function conducted at mid-term and after the project's completion."</i>	
B. M&E plan Implementation	Rating (six point scale): UA
The TE report does not address M&E in adequate detail. From the cancellation of the Project it is inferred that the project was not working well and this was recorded and reported by the M&E system, and based on this information the project was cancelled. Thus, preventing future losses in form of additional GEF and World Bank investments.	
C.1 Was sufficient funding provided for M&E in the budget included in the project document?	Unable to assess. No Project budget was included in the available Project Document
C.2 Was sufficient and timely funding provided for M&E during project implementation?	Unable to assess. No information available about this issue.
C.3 Can the project M&E system be considered a good practice?	Cannot be assessed as, on one hand, there is no evidence of M&E activities at any stage but, on the other hand, the cancellation of the Project evidence that there was a follow-up that led to this cancellation preventing additional losses by both GEF and World Bank.

4.5 Lessons and Recommendations

Project lessons and recommendations as described in the TE

What lessons mentioned in the TE that can be considered a good practice or approaches to avoid and could have application for other GEF projects?
Lessons Learned (Part 4, Terminal Evaluation document)
The SDC experiment offers many lessons specifically related to the development of the PV solar industry as well as more generally applicable to any project development process.
The main issues addressed are:
The PV SHS Market
<ul style="list-style-type: none"> Profitability. According to practitioners and industry investors, even if a technological breakthrough in PV panel production occurs, profitability perspectives for the industry may take years to improve unless the challenges of distribution and client financing are resolved. In cases of early stage market development, the existence of efficient and appropriate subsidies (e.g. sustainable, performance-based, etc.) generally contributes to an initially acceptable level of profitability. A

stable economic environment (limited business, political, and currency risk) supports long-term profitability. Nevertheless, PV firms are quite vulnerable to external factors such as equipment supply.

- **A coordinated approach.** A coordinated approach to building a sector in a given region – engaging policy makers and financing organizations, and coordinating with other donors active in the area – is key to addressing the PV challenge.
- **Customer Orientation.** A customer-orientation is critical to successful PV SHS service delivery. Distributors must become more customer-driven (e.g., know each customer's lighting/energy needs, learn how to adapt and finance products, etc.).
- **Maintenance.** The provision of efficient maintenance services is also critical to success. Profitable PV SHS retailers such as SELCO India and Grameen Shakti have emphasized maintenance in their business model. PV practitioners estimate that one-fourth to one-third of the two to three million solar home systems installed in the world, are no longer functioning.
- **Affordability.** Affordability is considered the main issue limiting the massive use of solar PV in off-grid, rural areas. It should be noted, however, that practitioners estimate the cost of a PV SHS system itself to represent just one-fourth of the total purchase costs (other costs include wiring, distribution, etc.).
- **Financing.** Upfront costs of PV systems are such that in many cases the only way for low-income customers to acquire them is with financing. End-user financing is key to the successful delivery of PV to low-income rural communities in developing countries. Credit schemes and collection methods must be flexible enough to allow access to credit to the poor and to help ensure high repayment rates. If end-user financing is provided by a third party, commitment of that organization is necessary for the success of the scheme. The strong involvement of the end-user financier and the vendor in the conception of the program is essential. The number of parties involved should be limited in order to limit the chances of failure.
- **Subsidies.** Retail level subsidies will likely continue to play a catalytic role in the growth of solar PV in emerging markets, until enterprises are able to reach sufficient scale to become profitable. End-user subsidies can help to quickly grow markets.

Investment Strategy

- The potential for equity investments in SMEs may be limited in developing countries. The failure to make equity investments through SDC, as well as the experience of other private equity funds, strongly suggests that private equity in SMEs may not yet be the catalytic capital solution for developing countries.
- **Diversification to renewable or clean energy.** Single focus funds are high risk investments. A clean energy focus may provide the best flexibility to finance the solar PV projects.
- **Focusing on a given region is more efficient.** Targeting financing on one country or region is a more efficient way to develop a PV solar market than pursuing a global focus.

Fund Management

- **Local management.** Ultimately, local management and oversight of investment will be critical to successful investments in emerging market SMEs. Successful managers will have excellent sectoral and regional experience and will offer substantive support to investees.
- **Streamline processes.** In order to increase efficiency in high risk, low return markets, it is essential to streamline processes, thereby limiting time and costs associated with each deal
- **Monitor and follow-up projects to identify problems early and draw lessons.** Monitoring and follow-up should be an important part of the mission for any organization investing in renewable energy in developing countries. It is all the more important that quality of management is often an issue in this high risk, low return industry, which has difficulty attracting the most entrepreneurial business people. A standardized follow-up process should be put in place. Part of an investor agreement may be conditioned on the investee fulfilling its information duty on a regular basis (e.g., every three months).

List (or if detailed summarize) the recommendations given in the terminal evaluation**Recommendations to the GEF/ IFC (Part 5, Terminal Evaluation document)****Overall**

The GEF/ IFC should offer important seed capital to mobilize and leverage significant resources from a range of funding partners. Pursuing a coordinated approach to building a sector in a given region – engaging policy makers and financing organizations, and coordinating with other donors active in the area – is particularly effective. They need to understand the market needs and ensure that the investment vehicles are designed to effectively meet them.

Solar PV.

The GEF and IFC still need to address the price/ perceived value dilemma facing the PV industry. Significant investments are required to achieve the technological breakthroughs that can meet the market demand of the millions of people living without electrical services. They also need to develop capacities of PV enterprises so that they may better absorb the private capital necessary to propel the industry forward.

The Right Kind of Capital. Subsidies, grants, and public procurement can play an important role in creating a market for PV in the developing countries. The second stage of financing consists of the development by private companies of a service infrastructure to directly access end-users. At this high investment/ low return stage, seed capital is most appropriate. Loans should come as a third step to support growing and established companies. A handful of companies in developing countries have reached this stage. Equity investments follow but are only occasionally of interest to SMEs in emerging markets.

Targeted Investments. For development of solar PV markets the GEF and IFC should have a country specific or regional focus instead of a global one. This will facilitate greater coordination, increase general awareness, help to grow markets and lead to decreased production and delivery costs.

Project Formulation

- Ensure the coherence of donor objectives and market needs.
- Conduct a thorough market needs assessment when designing and structuring projects.
- Update market intelligence and adjust project design and implementation as required.
- Align a project's scope with the available resources.

Project Implementation

- Use the simplest structure to implement projects.
- Maintain the sponsoring agencies' involvement in project implementation.
- Invest in coordination among the various PV initiatives supported in any given region.
- Make appropriate investments based on an enterprises' stage of growth.
- Consider, when possible, disbursing funds through already established investment institutions, in order to avoid expensive start-up costs.

Work closely with important stakeholders in any given region, preferably involving them early on in the planning process.

4.6 Quality of the evaluation report Provide a number rating 1-6 to each criteria based on: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, and Highly Unsatisfactory = 1. Please refer to document "GEF Office of Evaluation Guidelines for the verification and review of terminal evaluations" for further definitions of the ratings.

4.6.1 Comments on the summary of project ratings and terminal evaluation findings from other sources such as GEF EO field visits, etc.
An IFC/GEF Project Supervision Report from June 2003 (one year before Project cancellation), rated the Implementation Progress as Satisfactory on a 1-4 scale, at the Summary Part of the Report.. More detailed ratings within the Report rated the same point as Partially Satisfactory on 1-5 scale. There was no explanation about this discrepancy. Project Risks were rated as Substantial, and one (growth of project pipeline) as High.

4.6.2 Quality of terminal evaluation report	Ratings
A. Does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	5
B. Is the report internally consistent, is the evidence complete/convincing and are the IA ratings substantiated?	4
C. Does the report properly assess project sustainability and /or a project exit strategy?	5
D. Are the lessons learned supported by the evidence presented and are they comprehensive?	5
E. Does the report include the actual project costs (total and per activity) and actual co-financing used?	4
F. Does the report present an assessment of project M&E systems?	3
The TE does not address this issue in adequate detail.	

4.6.3 Assessment of processes affected attainment of project outcomes and sustainability.

Co-financing and Project Outcomes & Sustainability. If there was a difference in the level of expected co-financing and actual co-financing, then what were the reasons for it? Did the extent of materialization of co-financing affect project's outcomes and/or sustainability, and if it did affect outcomes and sustainability then in what ways and through what causal linkage did it affect it?
Yes, there were only USD 2.3 M of co-financing of USD 18.75 planned. The main reason was the poor performance of the project: only three SDF business development services interventions. The materialization of co-financing didn't affect project's outcomes or sustainability, as the TE report express. The non materialization was more due to lack of implementation progress.
Delays and Project Outcomes & Sustainability. If there were delays in project implementation and completion, then what were the reasons responsible for it? Did the delay affect the project's outcomes and/or sustainability, and if it did affect outcomes and sustainability then in what ways and through what causal linkage did it affect it?
Project was cancelled before its scheduled completion.

4.7 Is a technical assessment of the project impacts described in the TE recommended? Please place an "X" in the appropriate box and explain below.	Yes:	No: X
Explain: The TE develops itself around the project's performance, because the expected results and impacts don't happened.		

4.8 Sources of information for the preparation of the TE review in addition to the TE (if any)

1. Project Document for WP, September 1998 (595 solar.pdf)
2. Project Appraisal Document, July 2000 (595ProjectDocument_7-2000.doc)
3. IFC/GEF Project Supervision Report, June 2003 (595 Global_Solar Development Group.doc)