

# GEF IEO Terminal Evaluation Review form (retrofitting of APR2004 cohort)

This form is for retrofitting of the TERs prepared for APR2004. While several topics covered in this form had already been covered in the earlier form, this revised form adds several other performance and impact related concerns.

## 1. Project Data

Summary project data			
GEF project ID		119	
GEF Agency project ID		P003700	
GEF Replenishment Phase		GEF-1	
Lead GEF Agency (include all for joint projects)		World Bank	
Project name		Solar Home Systems	
Country/Countries		Indonesia	
Region		Asia	
Focal area		Climate Change	
Operational Program or Strategic Priorities/Objectives		OP-6	
Executing agencies involved		Government of Indonesia – Directorate General of Electricity and Energy Utilization ; Agency for the Assessment and Application of Technology	
NGOs/CBOs involvement		Not involved	
Private sector involvement		SHS dealers and Private banks – one of the beneficiaries.	
CEO Endorsement (FSP) /Approval date (MSP)		December 1996	
Effectiveness date / project start		October 1997	
Expected date of project completion (at start)		April 2002	
Actual date of project completion		December 2003	
Project Financing			
		At Endorsement (US \$M)	At Completion (US \$M)
Project Preparation Grant	GEF funding		
	Co-financing		
GEF Project Grant		24.3	4.52
Co-financing	IA/EA own		
	Government	1.5	0.59
	Other*	IBRD loan, \$20M; Participating national banks, \$5M; Participation SHS dealers and end users, \$67.3M	IBRD loan, \$0.08M; participating banks, \$0.06M; Dealers and end users, \$3.7M
Total GEF funding		24.3	4.52
Total Co-financing		93.8	4.43
Total project funding (GEF grant(s) + co-financing)		118.1	8.95
Terminal evaluation/review information			
TE completion date		June 2004	
TE submission date		2004	
Author of TE			
Original GEF IEO TER (2004) preparer		Baastel	
Original GEF IEO TER (2004) reviewer		Siv Tokle	
Revised TER (2014) completion date			
Revised TER (2014) prepared by		Joshua Schneck	

\*Includes contributions mobilized for the project from other multilateral agencies, bilateral development, cooperation agencies, NGOs, the private sector, and beneficiaries.

## 2. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF EO Review
Project Outcomes	U	U	U	U
Sustainability of Outcomes	-	L	L	ML
M&E Design	-	-	-	S
M&E Implementation	-	-	-	S
Quality of Implementation	HS	HS	HS	S
Quality of Execution		S	S	MS
Quality of the Terminal Evaluation Report	-	-	S	S

## 3. Project Objectives

### 3.1 Global Environmental Objectives of the project:

According to the Project Document (PD), the GEOs of the project are to mitigate emissions of CO<sub>2</sub> in Indonesia that contribute to climate change. The PD states that a “significant” portion of Indonesia’s rural population satisfies their energy needs by fossil fuel consumption, leading to CO<sub>2</sub> emissions. Penetration of Solar Heating Systems (SHS) would reduce CO<sub>2</sub> emissions through the displacement of fossil fuels. As stated in the PD, the anticipated lifetime direct reductions in CO<sub>2</sub> from this project are 1.3 million tons; with an additional 0.9 million tons CO<sub>2</sub>eq indirect reductions.

### 3.2 Development Objectives of the project:

According to the Project Document, the development objectives of the project were as follows:

- a. To provide electricity to rural customers who cannot be served economically or in a timely manner by conventional rural electrification;
- b. To facilitate participation by the private sector in advancing renewable energy commercialization;
- c. To promote environmentally sound energy resource development in Indonesia and reduce the energy sector’s dependence on fossil fuels; and
- d. Strengthen Indonesia’s institutional capacity to support and sustain decentralized rural electrification using solar photovoltaics

### 3.3 Were there any **changes** in the Global Environmental Objectives, Development Objectives, or other activities during implementation?

**No** changes to the overall GEO or DO were noted in the TE. However, the project was restructured following MTR in 2001, with several output targets reduced. The principle change is:

- SHS install target of 200,000 reduced to 70,000 units; and associated target for number of people served reduced from 2 million to 300,000.

#### 4. GEF EO assessment of Outcomes and Sustainability

Please refer to the GEF Terminal Evaluation Review Guidelines for detail on the criteria for ratings.

Relevance can receive either a Satisfactory or Unsatisfactory rating. For Effectiveness and Cost efficiency, a six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess. Sustainability ratings are assessed on a four-point scale: Likely=no or negligible risk; Moderately Likely=low risk; Moderately Unlikely=substantial risks; Unlikely=high risk. In assessing a Sustainability rating please note if, and to what degree, sustainability of project outcomes is threatened by financial, sociopolitical, institutional/governance, or environmental factors.

Please justify ratings in the space below each box.

4.1 <b>Relevance</b>	Rating: <b>Satisfactory</b>
----------------------	-----------------------------

According to the Request for CEO Endorsement, the project is consistent with the (then) draft GEF Operational Strategy 6. The project was expected to help lower the costs of solar PV technology in Indonesia, and set a new lower global benchmark price for SHS, thereby stimulating further penetration and realization of GEOs. The barriers targeted by the project included lack of established large markets for SHS and the lack of available credit for SHS purchases. Moreover, the project is relevant to Indonesia. Indonesia ratified the UNFCCC, making it eligible to receive GEF funds under the convention. According to the Request document, “the project has high priority in Indonesia, given that the access of rural Indonesian households to modern forms of energy less than commensurate with Indonesia’s overall level of economic development. As stated in the Request for CEO Endorsement, the GOI has a long history of commitment to the SHS project, This dates to 1993, when the GOI submitted a proposal for a similar project that included GEF funding. Following this, a formal request was submitted from the Vice Chairman of the Indonesian Planning Agency (BAPPENAS) to the Bank that reaffirmed the high priority placed by the GOI on using cost-effective renewable energy sources to meet growing energy demands in Indonesia, particularly in the rural areas (Request document, pg 8).

4.2 <b>Effectiveness</b>	Rating: <b>Unsatisfactory</b>
--------------------------	-------------------------------

According to the Terminal Evaluation, achievement of the project’s objectives was severely hampered by the Asian Financial Crisis of 1997, which affected the country just as project implementation started. While the project fell far short of original targets for SHS sales and associated GHG reductions, it reportedly succeeded in strengthening Indonesia’s institutional capacity to support and sustain decentralized rural electrification using PV, and in providing a model for participation by the private sector in advancing renewable energy commercialization. Achievements under each of the 4 DOs are as follows:

a) *Providing electricity to rural customers by SHS*: this DO was not achieved to any appreciable level. The original KPI target of 200,000 SHS installed – later reduced to 70,000 – was not met, as only 8,054 SHS

units were installed (4% of original target; 12% revised target) serving about 35,000 people (from an original target of 2 million, reduced to 300,000).

b) *Facilitate participation by the private sector in advancing renewable energy commercialization.* This objective was partially achieved as the number of SHS dealers increased from 1 to 6; prices of 50 Wp systems fell from \$550-\$800 at appraisal to \$450-525 at project completion; no problem loans were reported by SHS dealers; and the credit repayment rate is reportedly above 95%. In addition, 2 local Indonesian firms that received assistance with component design and testing are now exporting SHS components. At the same time, these achievements are tempered by the limited sales of SHS during the project’s implementation period. Judged by the extent of SHS sales, the project cannot be seen as having advanced participation by the private sector in a substantial way.

c) *Promote environmentally sound energy resource development in Indonesia and reduce the energy sector’s dependence on fossil fuels.* The KPI under this was fossil fuel conserved. Compared to an original target of 546,720 kiloliters, only 20,441 kiloliters (<4%) were conserved due to the limited number of SHS units installed.

d) *Strengthen Indonesia’s institutional capacity to support and sustain decentralized rural electrification using solar photovoltaics.* Achievements under this objective were to be measured by strengthening of the government agency’s (BPPT) capacity to certify the technical capabilities of solar PV systems and completion of a study on decentralized rural electrification and SHS. Achievements here were significant, although the planned study was cancelled due to time constraints and difficulty meeting Bank procurement requirements in a timely manner (ICR). The PV testing lab of BPPT obtained an ISO 17025 accreditation – beyond the original target – and it now tests and certifies products from the US, Indonesia, and the Netherlands. And a Project Support Group (PSG), established by the project, effectively carried out field audits and other monitoring responsibilities and provided capacity building and TA, including training of more than 479 staff in the rural distribution networks of the participating companies (ICR, pg 6).

<b>4.3 Efficiency</b>	Rating: <b>Moderately Satisfactory</b>
-----------------------	--

While the Efficiency of the project per se is not rated in the ICR, the ICR does provide an ERR and NPV analyses, which both indicate a favorable rate of return. The project also appears to have done an adequate job of restructuring and adapting to the financial crisis, and in doing so, was able to achieve some success in terms of capacity building and helping to modestly advance participation of the private sector in renewable energy. At the same time, the failure to conduct the study on decentralized rural electrification appears to have been largely under the control of the project’s management and was due to a failure to manage the Bank’s procurement requirements in a timely manner. In other respects, the project’s management was efficient – no delays were attributed to project management and the project is reported to have coordinated well with project stakeholders including the private banks, the GOI, and private sector SHS dealers. Efficiency is therefore rated as moderately satisfactory.

4.4 Sustainability	Rating: <b>Moderately Likely</b>
--------------------	----------------------------------

While the ICR rates sustainability of project outcomes are Likely, this review finds moderate financial risks that warrant downgrading of the sustainability rating to Moderately Likely. Sustainability is assessed along the following four dimensions:

1) *Environmental threats to sustainability* – (L) No significant threats to the sustainability of project outcomes are environmental in nature.

2) *Financial threats to sustainability* – (ML) Moderate financial risks exist to project sustainability. These primarily stem from the fact that continued and further expansion of SHS is dependent upon market forces that continue to be unpredictable. On the positive side, the business environment in Indonesia is recovering following the peak of the financial crisis in 1997-99 (ICR, pg 12). As a result, factors that limited the demand for SHS systems and the number of private banks willing to lend for SHS have improved. Additionally, the price of PV modules continues to decline, and the ICR cites a number of initiatives underway to assist SHS dealers in a transition to full commercial operation (without the subsidy). At the same time, the small size of the local market for SHS may limit the long-term sustainability of the SHS testing lab established through the project. Finally, the GOI continues to subsidize fossil fuels that compete with SHS systems.

3) *Institutional threats to sustainability* – (L) As per the information provided in the ICR, several institutional factors appear to be aligned positively in support of sustainability of project outcomes. These include: an Association of Indonesian SHS Dealers, established in 1992, was reactivated in 2000. This organization's goals are to promote SHS business activities, provide advice to SHS dealers, and inform GOI of SHS market opportunities. ICR reports that 8 companies are currently registered as members, and the Association is working on establishing an accreditation system. It also reports that the marketing, business and technical capabilities of SHS dealers have improved and that national quality standards and testing capabilities are in place (ICR, pg 12).

Socio-political threats to sustainability – (L) While the GOI continues to provide subsidies for kerosene and other fossil fuels which decrease the competitiveness of SHS, there are other more direct signs of support of SHS. ICR reports that local governments are starting to adopt a market based approach to SHS subsidies – moving away from the direct procurement policy (and subsequent free or highly subsidized distribution to a few households) that reduces the incentive for private firms to move into SHS. Moreover, the GOI is aware that increased adoption of SHS actually reduces government expenditures as less public funds have to be put towards fossil fuel subsidies.

## 5. Processes and factors affecting attainment of project outcomes

5.1 Co-financing. To what extent was the reported co-financing essential to the achievement of GEF objectives? 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? If so, in what ways and through what causal linkages?

Actual co-financing (\$4.43M) was a fraction (<5%) of original commitments. However, the failure of project to achieve sales of SHS systems on the scale originally envisioned is due largely to the effects of the Asian Financial Crisis. The crisis, while reducing the available credit (including promised co-financing from private banks), also reduced consumer demand as the local currency was devalued and the cost of alternative fossil fuels decreased further. Thus, the failure of co-financing to materialize in a substantial way likely contributed to some of the project's shortcomings, but was likely not the principle cause of the project's failings.

5.2 Project extensions and/or delays. If there were delays in project implementation and completion, then what were the reasons for it? Did the delay affect the project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

Delays and extensions were minimal and due to adaptive management in response to the Financial crisis. The ICR does note that the failure of the project to undertake a study on rural electrification was due to difficulties in meeting the Bank's procurement policies in a timely manner. However, no additional detail on this is available.

5.3 Country ownership. Assess the extent to which country ownership has affected project outcomes and sustainability? Describe the ways in which it affected outcomes and sustainability, highlighting the causal links:

Country ownership appears to have been strong and is evidenced by the GOI Agency's follow through on SHS certification of its lab and in the willingness of local governments to try new approaches in promoting and supporting SHS (moving away from the direct subsidy approach – see section on Sustainability).

## 6. Assessment of project's Monitoring and Evaluation system

Ratings are assessed on a six point scale: Highly Satisfactory=no shortcomings in this M&E component; Satisfactory=minor shortcomings in this M&E component; Moderately Satisfactory=moderate shortcomings in this M&E component; Moderately Unsatisfactory=significant shortcomings in this M&E component; Unsatisfactory=major shortcomings in this M&E component; Highly Unsatisfactory=there were no project M&E systems.

Please justify ratings in the space below each box.

<b>6.1 M&amp;E Design at entry</b>	Rating: <b>Satisfactory</b>
------------------------------------	-----------------------------

The project’s M&E system appears to have been well designed with a clear set of performance indicators under each development objective that were both manageable, and results-oriented. The PD states that the performance indicators and targets were developed through a consultative process with stakeholders (PD, pg 20). Moreover, responsibilities for M&E monitoring were delineated in the PD, and included creation of a project implementation support group (PSG), working in close coordination with the project’s management. M&E was clearly budgeted (pg 22, PD). Finally, there were provisions for a mid-term review and terminal evaluation, along with regular PIRs.

<b>6.2 M&amp;E Implementation</b>	Rating: <b>Satisfactory</b>
-----------------------------------	-----------------------------

Implementation of the project’s M&E systems appears to have occurred in a satisfactory manner. According to the ICR, the project was restructured several times to respond to changing market conditions in hopes of maximizing its development impact and ensuring that project objectives could be achieved to the highest degree possible. Regular PIRs were submitted and a mid-term review was undertaken that led to restructuring of the project’s targets. The ICR reports that both the PIRs and MTR were of high quality, and this extends to the quality of the project’s ICR. Co-financing is clearly reported as is the extent of achievement of all the project KPIs.

## **7. Assessment of project implementation and execution**

Quality of Implementation includes the quality of project design, as well as the quality of supervision and assistance provided by implementing agency(s) to execution agencies throughout project implementation. Quality of Execution covers the effectiveness of the executing agency(s) in performing its roles and responsibilities. In both instances, the focus is upon factors that are largely within the control of the respective implementing and executing agency(s). A six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess.

Please justify ratings in the space below each box.

<b>7.1 Quality of Project Implementation</b>	Rating: <b>Satisfactory</b>
--	-----------------------------

This project’s design was honored by the Bank’s senior management in 1998 and the project’s design elements have been incorporated in a number of other Bank/GEF PV projects (ICR, pg 4). During project implementation, bank supervision resulted in the project being restructured several times in response to changing market conditions – a clear example of adaptive management. As noted in the ICR, “without these efforts, the project would most likely have been ended much earlier as a matter of routine

portfolio clean up, which would have reduced the benefits achieved by the project up to date, most notably the technical and institutional capacity that has been built up in the country.” (ICR, pg 14). ICR reports that field visits were carried out twice per year, and MTR was undertaken in Sept 2000. Reporting is assessed as “candid and complete” in all aspects, and there was reportedly a strong working relationship between the GOI and the Bank. Failures of the project can most likely be attributed to forces beyond the control of the project’s management – principally the Asian financial crisis. The only blemish on the project’s management is the failure to undertake the study on rural electrification. Details of why this did not occur are not clear from the ICR.

<b>7.2 Quality of Project Execution</b>	Rating: <b>Moderately Satisfactory</b>
---	--

Project execution was carried out by two different GOI agencies, according to the ICR. The principle executing Agency (BPPT), was the main recipient of the technical assistance of the project, and successfully met the objectives it was responsible for – exceeding them in some cases. However, the performance of the DGEEU, charged with implementing the study on renewable energy, was unsatisfactory, as procurement delays led to the ultimate cancellation of this project component. Another aspect of the project execution was carried out by the Project Support Group (PSG) established by the project. Performance of the PSG is assessed as highly satisfactory as it provided substantial support and effective monitoring of project performance throughout the project’s implementation (ICR, pg 15). In addition, the ICR notes that PSG took a leading role in designing and managing the process of establishing a partial guarantee facility at a national bank (BRI) for transition to a post-project environment.

## **8. Assessment of Project Impacts**

8.1 Environmental Change. Describe the changes in environmental stress and environmental status that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

No changes in environmental stress or status are noted in the ICR, and reductions in CO2 emissions from the project are minimal. As noted above, the Asian Financial crisis was largely responsible for the failures of the project to have a more significant impact on GHG emissions in the short-term.

8.2 Socioeconomic change. Describe any changes in human well-being (income, education, health, community relationships, etc.) that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.



As reported in the ICR, a small impact study was undertaken during the course of project implementation, on the impact of SHS. The study found positive impacts of SHS, “ranging from additional lighting for more hours of study by children, reductions in expenditures for kerosene, increased use of the SHS house for social gatherings to enhanced appreciation of the house.” (ICR, pg 9). However, SHS was not found to have directly improved household income except in a few households. Moreover, SHS was not found to have affected gender roles, with the exception of possibly reinforcing the role of women in domestic chores such as cooking and cleaning (ICR, pg 9).

8.3 Capacity and governance changes. Describe notable changes in capacities and governance that can lead to large-scale action (both mass and legislative) bringing about positive environmental change. “Capacities” include awareness, knowledge, skills, infrastructure, and environmental monitoring systems, among others. “Governance” refers to decision-making processes, structures and systems, including access to and use of information, and thus would include laws, administrative bodies, trust-building and conflict resolution processes, information-sharing systems, etc. Indicate how project activities contributed to/ hindered these changes, as well as how contextual factors have influenced these changes.

a) Capacities – The PV testing laboratory of BPPT (government implementing agency) obtained ISO 17025 accreditation for PV components testing in part due to the support of this project. There are however concerns as to whether the small local market for PV is sufficient to sustain these capabilities.

b) Governance – The Association of Indonesian SHS Dealers, established in 1992, was reactivated in 2000 in part due to the support of this project. This organization’s goals are to promote SHS business activities, provide advice to SHS dealers, and inform GOI of SHS market opportunities. ICR reports that 8 companies are currently registered as members, and the Association is working on establishing an accreditation system. ICR also reports that the marketing, business and technical capabilities of SHS dealers have improved and that national quality standards and testing capabilities are in place (ICR, pg 12). In addition, ICR reports that local governments are starting to adopt a market based approach to SHS subsidies – moving away from the direct procurement policy (and subsequent free or highly subsidized distribution to a few households) that reduces the incentive for private firms to move into SHS. Moreover, the GOI is aware that increased adoption of SHS actually reduces government expenditures as less public funds have to be put towards fossil fuel subsidies.

8.4 Unintended impacts. Describe any impacts not targeted by the project, whether positive or negative, affecting either ecological or social aspects. Indicate the factors that contributed to these unintended impacts occurring.

No unintended impacts were reported to have occurred as a result of the project.

8.5 Adoption of GEF initiatives at scale. Identify any initiatives (e.g. technologies, approaches, financing instruments, implementing bodies, legal frameworks, information systems) that have been mainstreamed, replicated and/or scaled up by government and other stakeholders by project end. Include the extent to which this broader adoption has taken place, e.g. if plans and resources have been established but no actual adoption has taken place, or if market change and large-scale environmental

benefits have begun to occur. Indicate how project activities and other contextual factors contributed to these taking place. If broader adoption has not taken place as expected, indicate which factors (both project-related and contextual) have hindered this from happening.

Broader adoption of SHS has not occurred, principally due to the effects of the Asian Financial crisis, which severely limited achievement of project outputs. At the same time, there are signs that the steps taken towards creating a more supportive environment for SHS and renewables in Indonesia – from local governments starting to adopt market based approach to SHS subsidies (ICR, pg 13), to the establishment of a credit support facility at BRI national bank - may help facilitate broader adoption of project initiatives. However, the main drivers of such a change, if it were to occur, would be larger market forces that increase the competitiveness of SHS and PV systems, and increases in consumer demand for these products.

## **9. Lessons and recommendations**

9.1 Briefly describe the key lessons, good practices, or approaches mentioned in the terminal evaluation report that could have application for other GEF projects.

As stated in the ICR, experience with the project has generated the following set of lessons:

- A satisfactory business environment is necessary for success in a market development project
- Market-based projects should provide broad scope for companies to adjust product lines and business models to meet changing market signals
- Both front-loaded and performance-based grant support help induce retail market entry by for-profit companies for a variety of reasons.
- Performance-based grants for SHS sales in retail markets should scale down during implementation to facilitate transition of companies to commercial operations
- A convincing end-user audit program and transparent grant releases encourages companies to participate in the project and follow the consumer protection requirements
- Support to financial organizations is necessary to increase their knowledge of the market
- Highly subsidized systems made available to consumers through government and donor supported programs can undercut market development based projects

9.2 Briefly describe the recommendations given in the terminal evaluation.

The ICR offers the following recommendations:

- A carefully designed socio-economic survey mechanism should be built into SHS projects to assess their development impact. The recommendation comes on the back of the success of the survey done in this project. Despite the very short time between initial and follow-up survey, the study provided useful findings.

- Project design should focus as much on profitability as on affordability. According to the ICR, determining the profit potential necessary to induce risk taking for investment and market development should be a factor in setting grant levels and timing. This factor is seen as being as important as affordability and willingness and ability to pay.

## 10. Quality of the Terminal Evaluation Report

A six point rating scale is used for each sub-criteria and overall rating of the terminal evaluation report (Highly Satisfactory to Highly Unsatisfactory)

Criteria	GEF EO comments	Rating
To what extent does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	The report assesses all of the project's expected outcomes and indicators. A bit more detail should have been provided on the factors leading to the cancellation of the study on rural electrification.	S
To what extent is the report internally consistent, the evidence presented complete and convincing, and ratings well substantiated?	The report provides a detailed and convincing narrative of the project – from inception to project close. Ratings are well-substantiated. However, the rating on sustainability is challenged with respect to financial sustainability of SHS given the small progress to date and the continued subsidizing of competing fossil fuel alternatives	S
To what extent does the report properly assess project sustainability and/or project exit strategy?	The report does provide a detailed discussion of factors affecting project sustainability. However, as noted above, the report's assessment of financial sustainability of project outcomes appears a bit optimistic.	S
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	Lessons and recommendations are detailed, and flow well from the evidence presented in the body of the ICR.	HS
Does the report include the actual project costs (total and per activity) and actual co-financing used?	Yes. The report does an excellent job of detailing project expenditures and co-financing.	HS
Assess the quality of the report's evaluation of project M&E systems:	The report does a good job of assessing implementation of the project's M&E system. A bit more detail could have been provided on an assessment of the design of the M&E system.	S
<b>Overall TE Rating</b>		<b>S</b>

## 11. Note any additional sources of information used in the preparation of the terminal evaluation report (excluding PIRs, TEs, and PADs).

No additional sources of information were used in preparing the TER, other than PIRs, PD, and the ICR.