

## GEF EO Terminal Evaluation Review Form

1. PROJECT DATA				
GEF Project ID:	<b>643</b>		Review date: at endorsement (Million US\$)	at completion (Million US\$)
IA/EA Project ID:	<b>60718</b>	<b>GEF financing:</b>	8.9	8.9
Project Name:	Renewable Energy for Agriculture	IA/EA own:		
Country:	<b>Mexico</b>	Government:		
		Other*:		
		<b>Total Co financing</b>	22.4	12.8
Operational Program:		<b>Total Project Cost:</b>	<b>31.3</b>	<b>21.7</b>
IA	World Bank	<b>Dates</b>		
Partners involved:	Trust Fund for Shared Risk (FIRCO)	Work Program date		05/07/1999
		CEO Endorsement		11/19/1999
		Effectiveness/ Prodoc Signature (i.e. date project began)		<b>08/28/2000</b>
		Closing Date	Proposed:	Actual:
		<b>06/30/2004</b>	<b>06/29/2006</b>	
Prepared by:	Reviewed by:	Duration between effectiveness date and original closing:	Duration between effectiveness date and actual closing:	Difference between original and actual closing:
Soledad	Anna	<b>46 months</b>	<b>70 months</b>	<b>22 months</b>
Author of TE: Team Leader: Michael G Carrol		TE completion date:	TE submission date to GEF EO:	Difference between TE completion and submission date:
		<b>01/ 20/2007</b>	<b>10/04/2007</b>	<b>8 months</b>

\* 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	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>
2.2 Project sustainability	<b>N/A</b>	<b>MU</b>	<b>MU</b>	<b>ML</b>
2.3 Monitoring and evaluation	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>
2.4 Quality of the evaluation report	<b>N/A</b>	<b>N/A</b>	<b>S</b>	<b>S</b>

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

YES. The report is clearly written, addresses all issues requested in the GEF-EO guidelines for TE. All sections and analyses are well substantiated with data. It provides sufficient information on all significant issues pertaining to the project.

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 Project Document, the proposed project would be the first GEF project to target renewable energy in the agriculture sector. Its global objectives are:

- a) To promote the use of renewable energy for productive purposes in Mexico's agriculture sector by removing barriers and reducing implementation costs; and
- b) To reduce greenhouse gas emissions in the agriculture sector.

According to the TE, there were no changes in global objectives during implementation.

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

According to the project document the development objectives were:

- a) To provide farmers in isolated areas with reliable electricity supply for productive purposes in a sustainable manner, using renewable energy technologies where feasible; and
- b) To increase the productivity and income of farmers by supporting productive investments and improving farming practices.
- c) To improve FIRCO's ability to catalyze the penetration of renewable energy technologies in the agriculture sector

According to the TE, there were no changes to the development objectives during implementation.

## 3.2 Outcomes and Impacts

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

The TE report states that if the GEF had not contributed to the project, activities would simply have concentrated on improving livelihoods through promoting productive uses in agriculture. In this sense, GEF funding "was essential to produce the incremental effect of promoting renewable energy and subsequent carbon emissions reductions".

- An estimated 2,312 farmers who previously had had no electricity were provided with a reliable electricity supply for productive purposes in a least-cost and sustainable manner, primarily (but not exclusively) through photovoltaic-energy water-pumping Systems.
- A significant number of farmers saw their productivity and incomes increase as a result of their adoption of productive investments and improved farming practices. A rough preliminary estimate, based on an evaluation of three beneficiary farms, shows that in these cases average on-farm increases in income more than doubled (rising by 139%) – correcting for the distortion of receiving project income.

## 4. GEF EVALUATION OFFICE ASSESSMENT

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

#### A Relevance

Rating: S

The project was highly relevant to Mexico's efforts to further the development of its agricultural sector by raising farm productivity while simultaneously reducing farmers' dependence on carbon-emitting internal combustion engines for electricity. In addition, it was highly relevant to the GEF OP 6 and 7.

#### B Effectiveness

Rating: S

The project achieved all three project development objectives defined at appraisal. An estimated 2,312 farmers who previously had had no electricity were provided with a reliable electricity supply for productive purposes in a least-cost and sustainable manner, primarily (but not exclusively) through photovoltaic-energy water-pumping systems.

#### C Efficiency (cost-effectiveness)

Rating: S

According to the TE the project was cost effective because despite lower expenditure than anticipated at appraisal, the project achieved its development objectives. In addition, the outcomes of the project produced significant on-farm benefits. In part this is because of government subsidies provided by the Alianza program and by this project, but also it appears that incomes have increased significantly following project-induced growth in production and productivity.

### 4.1.2 Impacts

As shown in annex 13.1, in its final year of implementation the project avoided more than 36,292 tons of carbon emissions (121% of its target figure of 30,000 tons). According to the TE, this reduction is expected to be sustained and increased in the future as further replication systems are implemented.

The project was instrumental in developing capacity and raising among key institutions in Mexico (including industry and academia) to understand and share knowledge on viable applications of renewable energy in Mexico.

**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)

<b>A Financial resources</b>	<b>Rating: ML</b>
<p>According to IEG, the main risk to sustainability of the project's outcome is the possibility that the government may discontinue subsidizing investments in renewable energy applications in agriculture. This risk is significant given the recent advent of a new government, and that future PV system investments will require continued subsidy. There are two other risks –projected increases in farm production may fail to materialize (for example, due to a fall in output prices), and the rate of system breakdown and maintenance costs may be higher than anticipated. The second of these risks is low, but the first is considered moderate.</p> <p>It does appear, however, that it might be possible for a follow-up operation to build on the project using an IBRD loan investing in a broad rural development strategy implementing integrated natural resource management activities aimed at developing productive processes and linking this with a GEF grant aimed at promoting the use of renewable energy within these productive processes. This would both facilitate supply of renewable energy and increase demand to ensure replication and long-term sustainability of interventions.</p>	
<b>B Socio political</b>	<b>Rating: ML</b>
<p>According to IEG review of the terminal evaluation, the main risk to sustainability of the project's outcome is the possibility that the government may discontinue subsidizing investments in renewable energy applications in agriculture. This risk was categorized as significant given the recent advent of a new government, and that future PV system investments would require continued subsidy. At the time of this evaluation, the government changed and the project apparently continued.</p>	
<b>C Institutional framework and governance</b>	<b>Rating: ML</b>
<p>The project generated stakeholder ownership and strong partnerships. Although the primary objective of the project had to be environmental rather than social in nature, achievement of significant reductions in poverty were ensured as most of the beneficiaries were small farmers, located a long way from the electricity grid and classified as being below the poverty line.</p>	
<b>D Environmental</b>	<b>Rating: L</b>
<p>According to IEG, the project was rated category B since no major negative environmental impact was anticipated. Indeed, the project was intended to benefit the environment, and complied throughout with all relevant safeguards policies.</p> <p>During preparation, concern was raised over the possible use of batteries to store power as the disposal of these could lead to pollution. In the final project design, this was avoided by ensuring that the systems promoted used only involved direct power and no storage. In other applications such as the pilot projects testing the viability of producing and using milk cooling equipment, care was made when reviewing plans to ensure all applications conformed to safeguards criteria.</p> <p>The possibility of depletion of water in cases where water pumping systems were used was mitigated by ensuring that the farms where this was used had an adequate supply of groundwater and that the wells were sufficient to supply the pumping equipment.</p>	
<b>4.3 Catalytic role</b>	
<b>a. Production of a public good</b>	
<p>The project has enabled the development of a new understanding of how to implement renewable energy projects, and is included as a case study in the Bank's renewable energy toolkit.</p>	
<p>The project helped to build capacity in both FIRCO and the Ministry of Agriculture in the promotion of renewable energy use. Thanks to the achievement of project objectives, especially in the light of the experimental nature of the operation, results were widely disseminated in the Bank and the GEF (through the renewable energy toolkit and the golden plough award) and more widely in Mexico and beyond via renewable energy congresses and the renewable energy colloquium held in Mexico City in 2006. Knowledge was also disseminated to private industry and to academia as well as to direct beneficiaries through extension services.</p>	
<b>b. Demonstration</b>	
<p>The project sought to establish a critical mass of demonstrations – at least 34 in each state – to catalyze the formation of local or regional markets for renewable energy systems. In practice, a total of 1,545 demonstrations were funded in 28 States. The average number of demonstrations per state was 55.</p>	
<b>c. Replication</b>	
<b>d. Scaling up</b>	
<b>4.4 Assessment of the project's monitoring and evaluation system based on the information in the TE</b>	
<b>A. M&amp;E design at Entry</b>	<b>Rating (six point scale): S</b>
<p>18 key indicators were developed at appraisal; these were appropriate and most of them were used to measure the project's impact. According to the TE, the Project Coordination Unit at FIRCO headquarters produced the monitoring guidelines in the Operational Manual. These guidelines included the preparation of diagnostic studies of every demonstration project, a program of technical assistance for every beneficiary, and a program of training events and demonstrations. Each regional office prepared State Energy Programs with detailed information on each demonstration unit[1], further information on overall plans and targets, periodic progress reports and a final evaluation report at the end of the project. This information was passed to FIRCO and is partially expressed in the</p>	

project indicators which were regularly updated

**B. M&E plan Implementation**

**Rating (six point scale): S**

According to the TE, comprehensive monitoring was achieved by combining information on physical conditions (provided by FIRCO) and financial conditions (provided by NAFIN). This monitoring followed the guidelines in the Operational Manual produced by the Project Coordination Unit at FIRCO headquarters and included diagnostic studies of every demonstration project, a program of technical assistance for every beneficiary, and a program of training events and demonstrations.

Field activities were closely monitored throughout, with information being collected by each of FIRCO's 28 regional offices. As the IEG report states, "The offices prepared energy programs for their states, and also training events and demonstrations. These fed into the national workshops and programs. A web-based information system was developed. Both the MTR and the Borrower's report (prepared by FIRCO) contain a thorough assessment of project achievements. One drawback of the indicators was that they did not enable the regular monitoring of changes in beneficiary income or types of beneficiary.

The monitoring and evaluation procedures enabled further testing and modification over the following months to ensure that the optimal TA was provided. For instance, in the case of water pumping, some farmers found that the increased availability of water enabled them to undertake dramatic changes such as beginning livestock farming in addition to cultivation. This required further TA to ensure optimal returns to these new activities through marketing and processing. Following this, improvements to the TA were made, both by ensuring that the TA provided would meet these needs and ensuring that other project activities complemented this such as in the development of further uses of renewable energy.

Since being developed and optimized, close supervision then enabled further integration of this TA throughout the project to complement other components such as pilot projects, education, market studies and dissemination. Through this work, the project has developed new understanding of how to conduct such renewable energy projects and is included as the key case study in the World Bank's Renewable Energy Toolkit (<http://retoolkit.worldbank.org/>) regarding the use of renewable energy in productive processes. For its outstanding supervision, the project was also short listed for a World Bank Golden Plough Award in 2006.

**C.1 Was sufficient funding provided for M&E in the budget included in the project document?**

UA. It is not disaggregated

**C.2 Was sufficient and timely funding provided for M&E during project implementation?**

UA. It is not disaggregated.

**C.3 Can the project M&E system be considered a good practice?**

Yes. In addition to being proposed for a WB award for its supervision activities, the project designed the M&E system at entry and during implementation, having selected appropriate indicators, and different methods.

**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?**

Most lessons refer to project management

- (i) Close monitoring and tracking of Technical Assistance and its results through innovative use of the internet and GIS can help greatly to evaluate the success of activities and to modify and optimize them.
- (ii) A close relationship developed with the client (itself helped through continuity of a project's Task Team Leader during preparation and implementation) was instrumental in helping both to identify and to develop improvements during project implementation.
- (iii) Flexibility in project design and implementation can help to make subsequent modifications and fully integrate these with other parts of the project to improve efficiency.

**List (or if detailed summarize) the recommendations given in the terminal evaluation**

1. Implementing the project through FIRCO within the department of agriculture rather than the department of energy because it ensured that renewable energy provision remained demand-driven and could be tailored to the needs of farmers.
2. Replication. Projects must plan how to keep track of replication systems installed and take great care if trying to implement a vendor financing mechanism.
3. Financing scheme. For renewable energy investments to have a high impact and broad replication an effective financing scheme is very important and this will most likely have to involve subsidized financing.
4. Indicators. In future similar projects, it might be suitable to explicitly monitor types of beneficiaries and changes in income alongside other indicators.

**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.**

None

<b>4.6.2 Quality of terminal evaluation report</b>	<b>Ratings</b>
<b>A. Does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?</b>	5
<b>B. Is the report internally consistent, is the evidence complete/convincing and are the IA ratings substantiated?</b>	5
<b>C. Does the report properly assess project sustainability and /or a project exit strategy?</b>	5
<b>D. Are the lessons learned supported by the evidence presented and are they comprehensive?</b>	6
<b>E. Does the report include the actual project costs (total and per activity) and actual co-financing used?</b>	5
<b>F. Does the report present an assessment of project M&amp;E systems?</b>	6

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

**Co-financing and Project Outcomes & Sustainability.**

According to the IEG report, total project costs at completion were US\$21.73 million, about 70 percent of the US\$31.3 million estimated at appraisal. The GEF grant of US\$8.9 million was meant to cover 28.5 percent of total project costs. It ended up being fully disbursed and accounting for 50 percent of costs. The cost savings of US\$9.57 were concentrated in demonstration systems (US\$2.87 million), vendor financing (US\$2.09 million), and technical assistance (US\$3.5 million). Project management costs, mainly incurred by FIRCO, were also nearly US\$1 million less than anticipated. The vendor financing pilot component did not receive the expected response from States, and little vendor financing in fact materialized. Demonstration costs savings were due to lower installation and parts costs, reflecting in part economies of scale from increased supply. Although technical assistance was successfully implemented, and indeed amplified, only 81 extension workers were ultimately required, 30 less than originally envisaged. This is the only explanation provided in the TE for the lower costs of this component.

**Delays and Project Outcomes & Sustainability.**

According to the IEG's evaluation report, at the Borrower's request, the original closing date of June 30 2004 was extended by two years, and the project closed on June 29, 2006. This was mainly due to start-up delays. The project was under the auspices of a national agricultural and rural development initiative known as the Alianza para el Campo. Prior commitments initially prevented the Alianza program from accompanying the project's investments. After these initial delays, implementation proceeded satisfactorily.

**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:

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

Last PIR (2006)  
Implementation Status Results (2006)  
IEG Evaluation  
Project Document Brief