1. Project Data

GEF Project ID	112
IA/EA Project ID	502223
Focal Area	Climate Change
Project Name	Photovoltaic Market Transformation Initiative (IFC)
Country/Countries	India, Kenya and Morocco
Geographic Scope	Global
Lead IA/Other IA for joint projects	World Bank/IFC
Executing Agencies involved	MNRE, IREDA
Involvement of NGO and CBO	Not involved
Involvement of Private Sector	Yes- Primary component
Operational Program or Strategic Priorities/Objectives	6 - Promoting adoption of renewable energy by removing barriers/reducing implementation costs
TER Prepared by	Sunpreet Kaur
TER Peer Review by	Neeraj Negi
Author of TE	
Review Completion Date	
CEO Endorsement/Approval Date	6/17/1998
Project Implementation Start Date	7/1/1998
Expected Date of Project Completion (at start of implementation)	6/1/2010
Actual Date of Project Completion	6/30/2010
TE Completion Date	NA
IA Review Date	NA
TE Submission Date	10/11/2012

2. Project Financing

Financing Source	At Endorsement (millions USD)	At Completion (millions USD)
GEF Project Preparation Grant	0.375	0.375
Co-financing for Project Preparation	0.215	0.215
Total Project Prep Financing	0.590	0.590
GEF Financing	30	18
IA/EA own	90	NA
Government		
Other*		
Total Project Financing	120	18
Total Financing including Prep	120.590	18.59

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

3. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF Evaluation Office TE Review
Project Outcomes	Satisfactory	Moderately Unsatisfactory	Not reviewed	Moderately Unsatisfactory
Sustainability of Outcomes	N/A	Not mentioned	Not reviewed	U/A
Monitoring and Evaluation	Not mentioned	Not mentioned	Not reviewed	Satisfactory
Quality of Implementation and Execution	N/A	Not mentioned	Not reviewed	Moderately Satisfactory
Quality of the Evaluation Report	N/A	N/A	Not reviewed	Unsatisfactory

4. Project Objectives

4.1. *Global Environmental Objectives of the project:*

The Project Document lists the project's global environmental benefit as: "To promote photovoltaic systems as an environmentally beneficial alternative for distributed generation in India, Kenya and Morocco". In addition to the long term impact of development of markets for PV systems, a direct benefit of PVMTI was intended to be the reduction in carbon and other GHG emissions resulting from the installation of a significant number of PV systems. There was no change made to this objective.

4.2. *Development Objectives of the project:*

The original objective of the project noted in the Project Document states that: "PMVTI will be primarily directed towards promotion of market development projects (not manufacturing) for the reduction of barriers to the introduction of renewable energy technologies". As per the most recent update (Dec 2008), the TE notes the project's objective as: "To help PV businesses and projects in India, Kenya and Morocco to grow towards financial viability".

4.3. *Changes in the Global Environmental Objectives, Development Objectives, or other activities:*

Criteria	Change?	Reason for Change
Global Environmental Objectives		
Development Objectives	Yes	Any other (specify to the right) No specific reason for making a change to the project's development objective is noted in the TE.
Project Components		
Other activities		

5. GEF EO Assessment of Outcomes and Sustainability

5.1. *Relevance* – **Satisfactory**

The project's approval was consistent with the GEF Operational Strategy and Operational Programs in climate change mitigation, and is specifically targeted at the reduction of barriers to market penetration of photovoltaic technology (OP#6). At approval, the Program was of strong strategic relevance in both India and Morocco and to a lesser extent, Kenya where

market resources and off-grid demand were high. Despite the nascent market conditions in each of the target countries, each had a burgeoning interest in the PV sector. India had established a RE ministry almost a decade prior to PVMTI and the World Bank had provided nearly $200 million to a public enterprise, IREDA, dedicated to funding RE investments in the early 90's. As a result, public and industry awareness of support available for PV equipment and manufacturing was well established.

In Morocco, Centre de Développement des Energies Renouvelabes ("CDER") had been established since the early 80's to promote the use and awareness of RE systems in Morocco. ONE in concert with CDER had developed a subsidized rural electrification program, whereby tenders were let to private entrepreneurs offering fee-for-service PV powered SHSs.

In Kenya, a large and informal PV home lighting system market was emerging in response to the acute need for rural electrification.

5.2. *Effectiveness* – **Moderately Unsatisfactory**

The TE provides several evidences to note the development effectiveness of the project. These include:

- 9 projects/sponsors have been supported through this Program and have utilized roughly $18 million of PVMTI funds.
- Directly through this program, 106,500 SHSs representing a capacity of 5.8 MWp have been installed. The bulk of the installations were made by 3 sponsors in the Indian market.
- The knowledge materials were published and met a great success; this includes a guide for developers and investors on the large scale solar power plants subject.
- Joint ventures between FIs and PV companies are established and facilitated faster and smoother implementation of projects.
- Successful PV companies have been established.
- IFC has gained significantly from the project, which will benefit IFC in implementing similar projects efficiently.
- Moser Baer is setting up 30 MW solar power plant with the success of the 5 MW project. Many private sector players have also emulated the success of the Moser Baer project by taking advantage of JNNSM scheme.
- Installation of 94,000 SHSs lowered the use of kerosene for lighting in rural households for lighting thereby improving the indoor air quality.

Further, the GHG reduction resulting from 5.8 MWp of installed SHS capacity represents approximately 200,000 tons of CO_2e reduced over the life of the units/plant. Once the Moser Baer plant is constructed and operational, installed capacity will increase by 5MW and CO_2e reduced by 6,600 tons/year.

However, overall, PVMTI delivered mixed results, both with respect to its ability to source and close deals in what was, at the time of project approval, a difficult and early stage market, and

with respect to the performance of subsequent investments. Program results on a country by country basis varied with the Indian portfolio performing comparatively better than the Kenya and Morocco portfolio in terms of financing private PV companies and facilitating the supply of solar home systems to these markets.

The bulk of PVMTI funds disbursed – roughly $15.7 million – have funded projects in India. While the Program cannot claim that this overall market growth resulted from IFC activities, IFC did add-value to the emerging Indian PV market through incubating innovative firms and business models.

Roughly US$ 1.7 million of PVMTI funds were disbursed to 2 projects in Morocco resulting in a small number of PV installations (about 4,000 SHS), equivalent to about 300 kW, with little impact on CO_2 reduction.

5.3. *Efficiency* – **Moderately Unsatisfactory**

Regarding the project's efficiency, the TE makes note of the fact that the project did not do well in terms of SHSs and renewable capacity installed, and hence its efficiency in terms of GEF $/tons avoided was rated as partly unsatisfactory. However, there is a lack of corresponding evidence to support the claim, in terms of an assessment of the project's outcomes and impacts in relation to inputs and costs. As regards the implementation time taken by the project, it is noted that the project suffered from implementation delays, the reasons for which cannot be assessed due to lack of documentary evidence on the same. However, the TE makes a reference to the attribution of implementation delay to the administrative structure adopted in the project, which thereby hindered the pace of decision making. All decisions regarding investment commitment, loan closure, disbursements, and acceptability of loan collateral were made by IFC staff upon the recommendation of the External Management Team (EMT). This structure resulted in significant delays in the administration process, as those closest to the projects (EMT) were not those making the decisions.

5.4. *Sustainability* – **UA – Unable to assess risks**

NA

6. Processes and factors affecting attainment of project outcomes

6.1. *Co-financing*

6.1.1. To what extent was the reported co-financing essential to the achievement of GEF objectives? Were components supported by co-financing well integrated into the project?

UA

6.1.2. 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 it did, then in what ways and through what causal linkages?
UA

6.2. Delays

6.2.1. 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 it did, then in what ways and through what causal linkages?

The pace of decision-making was hindered by the administrative structure adopted in this program. The unique management structure created significant delays in the administration process. Following the Program mid-term evaluation in 2006, the Program was restructured in a manner that delegated more decision-making to the EMT.

6.3. Country ownership

6.3.1. 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:

New policies such as the National Solar Mission, which supports installation and manufacturing for both grid-tied and distributed solar systems, combined with regulations by the national and state regulators for renewable energy purchase and feed in tariffs, has resulted in a favorable environment for solar. Although these programs are currently in their infancy, the combination of the significant solar resource available throughout the country and the current Government focus (the stated goal of the National Solar Mission is 20 GW of solar power by 2020) could position India as a major player in the solar PV market.

7. Assessment of project's Monitoring and Evaluation system

7.1. *M&E design at entry* – **Satisfactory**

The M&E design presented in the Project Document describes the various monitoring requirements for the project, which included a quarterly summary of performance, annual audited accounts, periodic visits to selected investee companies to verify financial performance, periodic review of selected investments over their life to ensure compliance with environmental policies & guidelines, a mid-term review and a final program review. It was noted that the EMA will be responsible for day-to-day monitoring of PVMTI investments.

7.2. *M&E implementation* – **UA**

The TE does not make any reference to the implementation of M&E plan for the project.

8. Assessment of project's Quality of Implementation and Execution

8.1. *Overall Quality of Implementation and Execution* – **Moderately Satisfactory**

8.2. *Overall Quality of Implementation* – **Moderately Satisfactory**

With the project being a pilot phase project, the TE reports some of the challenges encountered during the course of project implementation.

When this Program started, systems and processes in IFC were geared towards large investments in the tens of millions. Hence, the investment documentation required for smaller investments of under $5 million which was what PVMTI needed were not appropriate. Closing investments subsequent to IRC turned out to be a real challenge and on average took longer than a year. The extensive investment documentation required by the IFC was cumbersome, with 70-page loan agreements for loans as small as $1 million. Currently these processes are far more streamlined and IFC has now created a simpler infrastructure to facilitate smaller investments such as the Clean Tech Fund.

Many proposals in response to the initial RFP (Request for Proposals) were weak and poorly written. Since the Program was operating in such an early stage market, resources should have been allocated to provide more upfront hand-holding to businesses seeking PVMTI support and to improve the quality of their proposals and their overall capacity which could have led to improved project performance.

It is also noted that there was a need to clearly define a mandate of responsibility and roles for the IFC country offices, at the outset of the project itself. This was done in Morocco and it worked to the Program's advantage. IFC in India did not play a similar role. A lesson learned is to engage IFC country teams when designing and implementing such programs and this is enabled by IFC's current focus on decentralization.

On the project design as well, it is reported in the TE that since this was a very early stage market, a more systematic analysis of the potential risks of the Program versus the perceived benefits resulting from it would have been very helpful. During the twelve years of the Program's implementation, these approaches are now standard for IFC market transformation initiatives. Since PVMTI was operating in a very early stage market where the enabling environment was clearly lacking, more funds should have been earmarked specifically for upstream sector-wide policy development, enabling environment strengthening and capacity building work. Also, in markets such as Kenya, where an appropriate enabling environment for mid-scale PV firms was lacking at the time of project approval, technical assistance would have been a more viable product to enter the market with, than the investment products PVMTI offered.

Given that the Program was looking for market opportunities to develop the PV sector in priority countries, far greater flexibility to support a range of business models and financial

structures was required than was originally supported in project design. For example, considering the risk/return profiles of many of the early movers in the market, a wider variety of equity/venture capital instruments should have been given more consideration. Also, there was no scope to provide support to entities helping the poorest of the poor as the Program only allowed focus on partnering with the private sector and these entities tended to be NGOs or non-profit entities and did not qualify for PVMTI investment based on initially established eligibility criteria.

The IFC Supervision Report 3 also reports some key questions to consider for the development of future initiatives. These include:

a) PVMTI used 3 countries as an example, and developed 13 sub-project investments (not counting Kenya TA). Of these only 3 (or just about 23%) will survive and likely grow. In order to make this happen, some $ 6 million in supervision has been spent. Whether EMT or internal PEP does this in the future, TL believes these costs are not out-of-line with what should be expected. IFC needs to consider carefully the cost-benefit analysis of this and similar ventures in the SME space.
b) As IFC looks to develop funds for new technology and clean technology, it is pertinent to focus on how these would be implemented by the potential sponsors, what the likely success ratios (i.e. how many will fail and how many succeed as investments) are, and whether there is a way to structure that puts value-at-risk to the lowest possible.

8.3. *Overall Quality of Execution* – **UA**

Unable to assess, as there is no direct documentary evidence available on this aspect.

9. Lessons and recommendations

9.1. *Key lessons*

9.2. *Key recommendations*

10. Quality of the Terminal Evaluation Report

Criteria	Rating	GEF EO Comments
To what extent does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	**Unsatisfactory**	No such assessment is provided in the TE report.
To what extent does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	**Satisfactory**	The TE report is consistent, and does provide detailed evidences with respect to all the IA ratings noted on various performance indicators.
To what extent does the report properly assess project sustainability and/or project exit strategy?	**Unsatisfactory**	No such assessment is provided in the report.
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	**Satisfactory**	The lessons learnt across different areas are well-supported by relevant evidence and comprehensively describe what worked well, what could have been done differently, etc.
Does the report include the actual project costs (total and per activity) and actual co-financing used?	**Highly Unsatisfactory**	The report lacks any break-up of the actual project costs (total and per activity) or the actual co-financing figures.
Assess the quality of the report's evaluation of project M&E systems:	**Unsatisfactory**	The TE lacks any discussion or documentation of evidence on an evaluation of the project's M&E systems.

11. Other issues to follow up on

No

Annex I – Project Impacts as assessed by the GEF Evaluation Office

Did the project have outputs contributing to knowledge being generated or improved?	Yes

WHAT OUTPUTS CONTRIBUTED TO KNOWLEDGE BEING GENERATED OR IMPROVED?

The project has created an information-sharing opportunity between the investees across different countries. It was proposed that the various investee company representatives are brought together to share the lessons learnt and exchange experiences. The project has continued to work with the companies and facilitate changes wherever needed.

Is there evidence that the knowledge was used for management/ governance?	UA

HOW WAS THIS KNOWLEDGE USED AND WHAT RESULTED FROM THAT USE?

NA

Did the project have outputs contributing to the development of databases and information-sharing arrangements?

Yes

WHAT OUTPUTS CONTRIBUTED TO INFORMATION BEING COMPILED AND MADE ACCESSIBLE TO MANY?

Four knowledge management reports were prepared and this includes three case studies written for “Selling Solar” publication. The case studies were widely disseminated in India and internationally.
A periodic project newsletter “PVMTI News” was published highlighting the project activities, accomplishments, challenges, and lessons learnt, and the copies were widely distributed.
The knowledge materials were published and met a great success; this includes a guide for developers and investors on the large scale solar power plants subject.

Is there evidence that these outputs were used?	UA

TO WHAT EXTENT HAVE THESE OUTPUTS BEEN USED?
WHAT HAS RESULTED FROM INFORMATION BEING MADE ACCESSIBLE TO OTHERS?

NA

Did the project have activities that contributed to awareness and knowledge being raised?	UA

WHAT ACTIVITIES CONTRIBUTED TO AWARENESS AND KNOWLEDGE BEING RAISED?

NA

Was any ***positive*** change in behavior reported as a result of these activities?	UA

WHAT BEHAVIOR (POSITIVE OR NEGATIVE) HAS CHANGED AS A RESULT?

NA

Did the project activities contribute to building technical/ environmental management skills? UA

WHAT ACTIVITIES CONTRIBUTED TO ***TECHNICAL/ENVIRONMENTAL MANAGEMENT SKILLS*** BEING BUILT OR IMPROVED?

NA

Is there evidence of these skills being applied by people trained? NA

HOW HAVE THESE SKILLS BEEN APPLIED BY THE PEOPLE TRAINED?

NA

Did the project contribute to the development of legal / policy / regulatory frameworks? UA

Were these adopted? NA

WHAT LAWS/ POLICIES/ RULES WERE ADOPTED AS A RESULT OF THE PROJECT?

NA

Did the project contribute to the development of institutional and administrative systems and structures? Yes

Were these institutional and administrative systems and structures integrated as permanent structures? No

WHAT OFFICES/ GOVERNMENT STRUCTURES WERE CREATED AS A RESULT OF THE PROJECT?

- Joint ventures between FIs and PV companies are established and facilitated faster and smoother implementation of projects
- Successful PV companies have been established.
- IFC has gained significantly from the project, which will benefit IFC in implementing similar projects efficiently.

Did the project contribute to structures/ mechanisms/ processes that allowed more stakeholder participation in environmental governance? No

Were improved arrangements for stakeholder engagement integrated as permanent structures? NA

WHAT STRUCTURES/ MECHANISMS/ PROCESSES WERE SUPPORTED BY THE PROJECT THAT ALLOWED MORE STAKEHOLDERS/ SECTORS TO PARTICIPATE IN ENVIRONMENTAL GOVERNANCE/ MANAGEMENT ACTIVITIES?

NA

Did the project contribute to informal processes facilitating trust-building or conflict resolution?	UA

WHAT PROCESSES OR MECHANISMS FACILITATED TRUST-BUILDING AND CONFLICT RESOLUTION? WHAT RESULTED FROM THESE?

NA

Did the project contribute to any of the following:		Please specify what was contributed:
Technologies & Approaches	Yes	Promotion of Solar PV products
Implementing Mechanisms/Bodies	No	
Financial Mechanisms	UA	

Did r**eplication** of the promoted technologies, and economic and financial instruments take place?	Yes

SPECIFY WHICH PLACES IMPLEMENTED WHICH TECHNOLOGIES/APPROACHES OR ASPECTS OF A TECHNOLOGY/APPROACH.

WHAT WAS THE RESULT IN THOSE PLACES (ENVIRONMENTAL & SOCIOECONOMIC)?

A highly successful energy access program at the IFC, Lighting Africa, emerged as a direct reaction to the lessons learned from the project and from the “Selling Solar” publication and can be considered a direct application of the Lessons Learned from this program.

Did **scaling-up** of the promoted approaches and technologies take place?	Yes

SPECIFY AT WHAT ADMINISTRATIVE & ECOLOGICAL SCALE AND WHICH TECHNOLOGIES/APPROACHES OR ASPECTS OF A TECHNOLOGY/APPROACH WAS ADOPTED.

HOW WAS IT MODIFIED TO FIT THE NEW SCALE? WHAT WAS THE RESULT AT THE NEW SCALE/S (ENVIRONMENTAL & SOCIOECONOMIC)?

Moser Baer is setting up 30 MW solar power plant with the success of the 5 MW project. Many private sector players have also emulated the success of the Moser Baer project by taking advantage of JNNSM scheme.

Did **mainstreaming** of the promoted approaches and technologies take place?	Yes

SPECIFY HOW (MEANS/ INSTRUMENT) AND WHICH ASPECTS OF THE TECHNOLOGY/APPROACH WAS INCORPORATED INTO THE EXISTING SYSTEM. WHAT WAS THE RESULT OR STATUS (ENVIRONMENTAL & SOCIOECONOMIC)?

With regards to the mainstreaming of approaches and technologies promoted by the PMVTI Program, the TE specifically makes note of the 2 important mainstream investments that IFC has made in the solar sector in India in FY10: Azure Power which is a grid-connected private solar IPP in India; and Applied Solar Technologies which provides solar based hybrid power solution to telecom towers, who often rely on diesel generators for 50 – 100% of their power requirements.
Apart from the specific mainstreaming efforts noted, a general shift in the Indian PV market is described as well. It suggests that the Indian solar energy sector has come a long way since the start of the PMVTI Program. New policies such as the Jawaharlal Nehru National Solar Mission (JNNSM), which supports installation and manufacturing for both grid-tied and distributed solar systems, combined with regulations, by the national and state regulators, for renewable energy purchase and feed in tariffs, has resulted in a favorable environment for solar. Although these programs are currently in their infancy, the combination of the significant solar resource available throughout the country and the current Government focus (the stated goal of the National Solar Mission is 20 GW of solar power by 2020) could position India as a major player in the solar PV market. This is in stark contrast to the early stage of the market in 1998, when PV module production was approximately 11 MWp to service a primarily small, niche, domestic market for rural electrification, water pumping and remote application. In 2012, PV module production is 1.5 GW with more than 70% of production being exported.

Did r**emoval of market barriers** and sustainable market change take place? Yes

SPECIFY HOW DEMAND HAS BEEN CREATED FOR WHICH PRODUCTS/ SERVICES THAT CONTRIBUTE TO GEBs.

Significant attribution can be made to the GEF project for the changes occurred in the relevant markets and the consequent market transformation. Without GEF support, it is likely that there would be fewer companies in PV in these countries, and those that did emerge would be a smaller size, perhaps would not have had the appropriate financing support for the PV products. Without this program, the coupling of FIs with system integrators may not have occurred, and if it had, would have occurred at a much slower pace.
The changes in the market barriers can also be attributed to governmental efforts to promote RE, including solar PV, competed with PVMTI, but also helped open up the market and establish solar PV as a viable technology. Furthermore, favorable tax, regulatory, and grid-extension policies of GoI also helped the development of the solar PV market in the country. Another GEF/World Bank project- Alternate Energy (ID76)- IBRD/IDA/GEF-funded financing window for PV equipment also mobilized private sector investments and commercialization of PV markets.

Based on most of the project's components and/or what it generally intended to do, what type of project would you say this is?

Broader Adoption *<--dropdown menu*

If "combination", then of which types?

& *<--dropdown menu*

*QUANTITATIVE OR ANECDOTAL DETAILS ON HOW ENVIRONMENTAL **PRESSURE HAS BEEN REDUCED/PREVENTED** OR ON HOW ENVIRONMENTAL **STATUS HAS CHANGED** AT THE DEMONSTRATION SITES AS A CONTRIBUTION/RESULT OF PROJECT ACTIVITIES. FOR SYSTEM LEVEL CHANGES, SPECIFY THE ADMINISTRATIVE AND/OR ECOLOGICAL SCALES.*

Was stress reduction achieved? | Yes

If so, at what scales? Please mark 'x' for all that apply

[x] Local	[ ] Intended (local)	[ ] Unintended (local)
[ ] Systemic	[ ] Intended (systemic)	[ ] Unintended (systemic)

How was the information obtained?

[ ] Measured	[x] Anecdotal

Was there a change in environmental status? | UA

If so, at what scales? Please mark 'x' for all that apply

[ ] Local	[ ] Intended (local)	[ ] Unintended (local)
[ ] Systemic	[ ] Intended (systemic)	[ ] Unintended (systemic)

How was the information obtained?

[ ] Measured	[ ] Anecdotal

Evidence of intended stress reduction achieved at the **local level**

The umbrella PVMTI project is estimated to have GHG reduction of 328,509 tons of CO2 over the 20 year project life (based on EMT report received May, 2008). Further, installation of 94,000 SHSs lowered the use of kerosene for lighting in rural households for lighting thereby improving the indoor air quality.

Evidence of intended stress reduction at a **systemic level**

NA

Evidence of intended changes in environmental status at the **local level**

NA

Evidence of intended changes in environmental status at a **systemic level**

NA

Evidence of unintended changes in stress or environmental status at the **local level**

NA

Evidence of unintended changes in stress or environmental status at the **systemic level**

NA

Were arrangements to collect data on stress reduction and environmental & socioeconomic status in place during the project?

Environmental No

Socioeconomic No

To what extent were arrangements in place and being implemented during the project? Briefly describe arrangements.

NA

To what extent did these arrangements use parameters/ indicators to measure changes that are actually related to what the project was trying to achieve?

NA

Were arrangements to collect data on stress reduction and environmental & socioeconomic status in place to function after the project?

No

To what extent were arrangements put into place to function after GEF support had ended? Briefly describe arrangements.

NA

Was there a government body/ other permanent organization with a clear mandate and budget to monitor environmental and/or socioeconomic status?

NA

Has the monitoring data been used for management? No

How has the data been used for management? Describe mechanisms and actual instances.

NA

Has the data been made accessible to the public?	UA

How has the data been made accessible to the public? Describe reporting systems or methods.

NA

"SOCIOECONOMIC" REFERS TO ACCESS TO & USE OF RESOURCES (DISTRIBUTION OF BENEFITS), LIVELIHOOD, INCOME, FOOD SECURITY, HOME, HEALTH, SAFETY, RELATIONSHIPS, AND OTHER ASPECTS OF HUMAN WELL-BEING .AS MUCH AS POSSIBLE, INCLUDE "BEFORE" AND "AFTER" NUMBERS, YEARS WHEN DATA WAS COLLECTED, AND DATA SOURCES.

Did the project contribute to **positive** socioeconomic impacts?	Yes

If so, at what scales?	Please mark 'x' for all that apply		
	[x] Local	[x] Intended (local)	[ ] Unintended (local)
	[x] Systemic	[x] Intended (systemic)	[ ] Unintended (systemic)
How was the information obtained?	[ ] Measured	[x] Anecdotal	

Did the project contribute to **negative** socioeconomic impacts?	No

If so, at what scales?	Please mark 'x' for all that apply		
	[ ] Local	[ ] Intended (local)	[ ] Unintended (local)
	[ ] Systemic	[ ] Intended (systemic)	[ ] Unintended (systemic)
How was the information obtained?	[ ] Measured	[ ] Anecdotal	

Evidence on intended socio-economic impacts at the **local level**

The program is responsible for installation and operation of 94,000 SHSs. The program thus improved the lives of approximately 470,000 people . Women and children have most benefited from this.
The project has popularized the use of solar PV lighting among small street hawkers by replacing the petromax lights. SELCO India has introduced this concept. The lights are rented to the hawkers by an entrepreneur at a cost comparable to those incurred on kerosene lamps.

Evidence on intended socio-economic impacts at **systemic level**

• In-country entrepreneurial interests are able to respond to expanded opportunities for organizing PV distribution, assembly, and financial enterprises, with associated increases in local employment.
• Rural energy users have access to a renewable energy resource with higher lighting values without the smoke and fire risk associated with traditional lighting sources (e.g., kerosene lanterns, candles). However, it cannot be determined whether they are actually making use of these RE resources or not.
• Commercial and private non-rural users have expanded options to receive reliable power.
• The project has helped offset requirements for rural grid connections, freeing the power sector to concentrate on more profitable core activities.

Evidence on unintended socio-economic impacts at the **local level**

NA

Evidence on unintended socio-economic impacts at **systemic level**

NA

Briefly describe the key lessons, good practice or approaches mentioned in the terminal evaluation report

Key lessons from the project as given in the IFC Supervision Report 5 are:
a) Difficult markets: The PVMTI experience has highlighted that solar PV projects are most challenging to implement precisely in those markets where the demand for it, and economic justification for it, might be the greatest. Often, rural, poor, and sparsely dispersed communities, who are far from the grid and thus need solar PV, are unlikely to generate the resources necessary for purchasing or maintaining these units without extensive subsidies.
b) Need for capacity building: PVMTI's experience has also shown that there is an ongoing need for capacity building and technical assistance. In fact, the program's focus in Kenya was solely on provision of technical assistance since the Kenyan market was not prepared for the financial product and services that the program offered. The minimum deal sizes were too large for existing solar PV firms, and larger entities, such as FIs, were not interested in pursuing the rural solar PV market. In recognition of this, PVMTI directed its efforts at providing technical assistance to raise public awareness of the merits of solar PV, upgrade the skills of local technicians, and foster an enabling environment for the establishment of high-quality solar PV products and service providers
c) Enabling environment is critical: Success in the solar PV business, and the appropriate business model to adopt, will depend to a large degree on the enabling environment in which the firm operates. India has the largest RE financing effort offered by any developing country. Governmental efforts to promote RE, including solar PV, compete with PVMTI, but also help open up the market and establish solar PV as a viable technology. Additionally, the fact that the population of India is large and densely populated means that service technicians can economically serve a small geographical area (relatively inexpensive to reach potential clients) with a critical mass of SHS units. Furthermore, favorable tax, regulatory, and grid-extension policies may help the development of the solar PV market in a given country.

d) Product Quality Standards: Many of PVMTI's investments found the lack of product quality standards to be detrimental to their operations. Muramati Tea Growers SACCO saw systems fail and installations delayed as a result of faulty batteries. SPM saw increased pressures on prices as a result of cheaper contraband product on the Moroccan market. In hindsight, PVMTI should have been more proactive in improving product quality and establishing quality-control mechanisms. A portion of the grant component would have been well spent investing in product innovation and quality control.

e) Project Financing Requirements: IFC's legal documentation and loan security documents are suited to large project finance transactions. They can be extremely burdensome and time consuming for SMEs that are more accustomed to much simpler due diligence processes. As a consequence, investment transactions take months or years to complete and, in some cases, market conditions will change significantly between the investment approval and financial closure time frame. A further consequence is that the administrative costs are high in relation to investment size.

Many solar PV businesses in the target countries found the $500,000 minimum investment to be too large. This was particularly true in Kenya, where investments were limited to FIs and banks. At the time, there were no solar PV businesses that could absorb the minimum $500,000 investment threshold. Going through the banks, however, proved to be cumbersome and time consuming, since the banks did not see financing SHS as a main line of business, and it was difficult to get many of them to move expeditiously on the projects.

Furthermore, the small businesses and entrepreneurs targeted by PVMTI found the extensive business plans and other documentation required to be somewhat daunting. While they had energy and ideas, many were not skilled in the writing of business plans. This resulted in long negotiation periods for customized contracts. In some instances it took a year from the date of review to the date of disbursal.

f) Dedication to solar PV and provision of value-added services are critical to success: All of the firms that achieved modest success in terms of utilizing PVMTI resources and drawing down their commitments were already in the solar PV business, or seeking to enter the business, when they received funding from IFC. PVMTI found that firms that provided further value added, in particular servicing and maintenance, were more successful. Those who moved farther up the value chain, and were involved in the assembly of solar components and the installation of systems, seemed to do significantly better than firms that were merely engaged in consumer or producer financing. Firms that received PVMTI financing that did not have a particular focus on solar PV were significantly less successful. Muramati Tea Growers SACCO, for example, was dedicated to providing financing to people working in the Kenyan tea sector, not to promoting solar PV. As a result, the financing of SHS fell outside the core business line, and proper resources were not dedicated.

g) Decision making needs to be done by those closest to the project: The pace of decision making was hindered by the administrative structure adopted in this project. All decisions regarding investment commitment, loan closure, disbursements, and acceptability of loan collateral were made by IFC staff upon the recommendation of the Extenal Management Team (EMT). This structure has resulted in significant delays in the administration process, as those closest to the projects (EMT) were not those making the decisions.

Briefly describe the recommendations given in the terminal evaluation

The TE does not provide any detailed recommendations from the project as such. However, a recommended follow-up action is noted with respect to the new business development or replication opportunity from the project, which states that: The renewable energy market development work in India will be informed by PVMTI Program and lessons learned from it.