

# Photovoltaic Market Transformation Initiative

The IFC/GEF Photovoltaic Market Transformation Initiative (PVMTI) is a \$30-million initiative designed to accelerate the sustainable commercialization and financial viability of energy services, based on solar electricity (solar PV) technology in India, Kenya, and Morocco. Funded by GEF and managed by IFC, PVMTI was based on the premise that private sector project design and financing on a commercial basis would stimulate more sustainable ventures than government or donor-financed solar PV procurements alone. Launched in 1998, PVMTI is still operational today, and has committed over \$18 million to 12 projects.

### BACKGROUND

The PVMTI concept originated at a meeting held in Princeton, New Jersey, in the early 1990s. The meeting was attended by a large number of academics, NGOs, the WBG, and others interested in the acceleration of the global market for solar PV and other RE technologies in developing countries. The original project concept, dubbed the “Green Carrot,” was based on the same market transformation concepts used by the United States Environmental Protection Agency’s (EPA) “Golden Carrot” program (see box, page 41). When offering the “prize” was deemed unfeasible, the program was rebranded as PVMTI, and management of the program was passed from the World Bank to IFC.

Although PVMTI was restructured under IFC, the lessons learned from “market pull” initiatives (undertaken in North America and Europe, which employed financial incentives to engage the private sector to encourage market adoption of new energy and RE technologies such as the “Golden Carrot”

program) continued to play a key role in the program design. While the initiative was originally conceived to be a \$60 million program that would involve global competitive procurement among private sector companies, it was soon decided that it would be more prudent to pilot the concept as a smaller \$30-million initiative, targeting a small number of countries.

### COUNTRY SELECTION PROCESS

The initial selection process began with the identification of 35 potential countries. Of these 35 countries, 30 were supplied with a summary of the PVMTI program concept and a request for an expression of interest. Of those that responded, Algeria, Argentina, Indonesia, Sri Lanka, Zambia, and Zimbabwe were removed from consideration due to planned World Bank and/or GEF projects, or unfavorable economic conditions. The remaining countries, Brazil, China, India, Kenya, Morocco, Pakistan, and Thailand, were visited for further consultation during the first half of 1996.

Three countries were ultimately selected for implementation: India, Kenya, and Morocco. Each of the three was considered to have an emerging solar PV market and a supportive policy environment in which the solar PV sector could grow.<sup>32</sup> In India, home to the largest solar PV market in the developing world, PVMTI was expected to stimulate investments in new commercial (not government-driven) sectors. In Kenya, which had a dynamic solar PV market with over 150,000 SHS sold without any formal credit facilities, PVMTI was expected to provide working capital and end-user financing in a market dominated by small-scale enterprises. In Morocco,

PVMTI was expected to contribute to the demonstration of the potential of private franchise models and guarantee facilities to finance alternatives to nonviable grid extension, based on a commitment to solar PV by the national electric utility, Office National de l'Electricite (ONE).

During the preliminary stage, some 25 potential projects totaling nearly \$175 million in financing were identified. Many of these projects were to support companies that sold and/or leased, distributed, installed, and serviced solar PV equipment. Other projects were focused on supporting the expansion of existing sales and distribution networks and entry into new markets, and a small number of projects were identified working with FIS to establish financing mechanisms to support end user purchases.

## MANAGEMENT

During the country assessment period, it became apparent that a much higher level of engagement would be needed over a longer period of time than originally planned. Sector and country expertise, similar to that of an investment fund, was important if PVMTI were to succeed. Rather than establish in-house expertise, IFC management chose to select an external manager. IFC decided to retain Impax Capital Corporation (now Impax Asset Management, Ltd.)<sup>33</sup> and IT Power, Ltd.,<sup>34</sup> both firms experienced in managing small, innovative renewable energy portfolios, to serve as an external management team (EMT). The EMT also included local part-

ner organizations in each of the countries—IT Power India (a subsidiary of IT Power UK), Pipal Ltd. (a Kenyan project management company in the solar field), and RESING (a Moroccan project management company)—which provided critical support and local knowledge at all stages of the process.

The role of the EMT was to solicit, screen, and structure solar PV business proposals and conduct the appropriate commercial, technical, and financial due diligence. Once the EMT felt it had a solid project, it would present the project to the IFC Investment Review Committee (IRC) for final approval. After approval from the IRC, the EMT would be responsible for ensuring that all disbursement conditions were met, as well as for reviewing progress on a regular basis subsequent to disbursement. The EMT is compensated in two forms: a set project management fee paid quarterly over the life of the program, and a series of performance bonuses, some of which are tied to performance and some of which are tied to timing in the program. The set project management fees make up the majority of the EMT compensation.

## STRUCTURE

PVMTI was financed with \$30 million from GEF, allocated as follows: \$15 million for project financing in India, \$5 million each for Kenya and Morocco, and the remaining \$5 million to be used for technical assistance and project execution. The technical assistance component of the program amounted to \$3 million, or 10 percent of total funds. These funds were to be provided for non-commercial purposes, such as technical assistance, training, the development of standards, and additional uses as required by individual projects. It was expected that \$13.5 million would be recovered from investments and portfolio earnings, and would be returned to GEF at the end of PVMTI's operational period.

The financing terms offered by PVMTI's were designed to be sufficiently flexible to respond to the needs of each project, and included debt, guarantees, and grant funding. Most investments were expected to request debt at or below market terms. Additional financing tools, including partial guarantees and equity, were also available, if the benefits of such tools were deemed sufficient to justify the increased complexity.

<sup>32</sup> Each country had, at the time, a large number of households in off-grid areas, an adequate financial services sector, and an existing solar PV sales market (either subsidized or unsubsidized).

<sup>33</sup> Impax Asset Management, Ltd., is a specialist fund management company focused on the environmental sector. With £420m (\$838 million) in funds under management in a combination of listed and private equity, Impax had the necessary skills to assess potential investments and to implement the same.

<sup>34</sup> IT Power, Ltd., is an energy consulting firm with a specialization in RE engineering and related economic, financial, commercial, and environmental considerations. IT Power has completed over 1,000 projects for both government and private sector clients in over 100 countries.

### THE GOLDEN CARROT PROGRAM

The Golden Carrot program is a federal program of the United States Environmental Protection Agency designed to support the commercialization of new energy-efficient appliances in the residential sector.

The "Golden Carrot" program offered a financial incentive to manufacturers to support advances in energy efficiency. In the program, 24 utilities pooled \$30 million in the Super Efficient Refrigerator Program. That program then held a contest, and the manufacturer that built the most efficient CFC-free refrigerator at the lowest cost was awarded guaranteed rebates from the pool to offset the incremental product costs. At the same time, consumers got more affordable and environmentally friendly refrigerators.

## RESTRUCTURING

In 2004, PVMTI underwent a significant restructuring. The slow execution of deals in the early years of the PVMTI program, due to the extensive documentation, minimum investment size, and long negotiation periods, resulted in a lower-than-expected disbursement rate. With funds not being disbursed, the expected reflows (interest and principal payments) did not accumulate as expected, and PVMTI ran into issues with insufficient cash flow to cover its ongoing administrative and operating costs. The restructuring sought to extend the program implementation period by two years (from 10 years to 12), in an effort to bring disbursements of committed funds to approximately 70 percent, and to reclassify \$1 million of PVMTI's investment funds to finance the cash shortfall on the administrative side of the project.

As part of the 2004 restructuring, PVMTI also received approval for a grant of approximately \$350,000 for a stand-alone technical assistance capacity-building program in Kenya. This project consists of the development of training curriculum and the provision of training to solar PV technicians, creation of quality awareness in the market, establishment of a quality assurance program for SHS in the Kenyan market, and provision of support to the Kenyan Renewable Energy Association (KREA). The total cost for these activities is estimated at \$476,900, which includes about \$115,000 of in-kind contributions and co-financing for the project. The GEF funds used for this are all grant funds.

<sup>35</sup> It is important to note that projects approved through the IRC are documented by the IFC legal team. In some cases, projects were approved by the IRC, but legal documentation was not finalized due to a variety of reasons.

In October 2006, PVMTI sought, and was granted, approval from GEF to increase the funds available for technical assistance, from a maximum of 10 percent of the overall program funds to a maximum of 20 percent. This request was made in response to the findings of the Mid-Term Review that suggested IFC should explore the possibility of deploying uncommitted investment resources to grant-oriented technical assistance activities, such as training, solar PV information dissemination, and capacity building for the industry sector that will help advance the overall objective of PVMTI. This was suggested, in part, because PVMTI was one of the earliest market transformation initiatives that IFC had managed, and lessons from subsequent projects seemed applicable to PVMTI at the mid-term point. Since PVMTI's inception, IFC has managed a number of other programs that have resulted in greater market impact than PVMTI is likely to have at the end of its life. This is mainly the result of a larger emphasis on technical assistance and capacity building (as a portion of overall investments). The change in October 2006 sought to correct this imbalance, while there was still ample time within the PVMTI program to implement new technical assistance and capacity building.

## PERFORMANCE

To date, the IRC has approved a total of 16 sub-projects (six in India, six in Kenya, and four in Morocco).<sup>35</sup> The active PVMTI portfolio is comprised of nine projects with commitments of over \$17.5 million (see Table 7 at left).

Experience to date with the different projects has been mixed, with some proving very successful and some unable to make any progress due to a variety of outside reasons. This report has focused on Muramati District Tea Growers Savings & Credit Cooperative Ltd. (Muramati), SREI Infrastructure Finance, Ltd. (SREI), and Sunlight Power Maroc S.A. (SPM). These projects were selected to be representative of the overall PVMTI portfolio, as they represent projects in each of the countries in which PVMTI was active, projects involving both financial intermediaries and direct investments with PV companies, and projects that achieved varying degrees of success.

**TABLE 7: PVMTI'S ACTIVE SOLAR PV PROJECT PORTFOLIO**

PROJECT	COMMITMENT (IN MILLIONS)	UNITS INSTALLED (APPROXIMATELY)
Selco India	1.10	15,000
Eskom-Shell Solar Home Systems	3.90	26,000
Shri Shakti	2.23	2,000
SREI Infrastructure Finance, Ltd.	3.50	15,000
<b>Total India</b>	<b>10.73</b>	<b>58,000</b>
Barclays Bank, Kenya	2.00	0
Equity Building Society (EBS)	2.10	0
Muramati Tea Growers SACCO	0.60	170
<b>Total Kenya</b>	<b>4.70</b>	<b>170</b>
Salafin S.A.	1.00	0
Sunlight Power Maroc S.A.	1.075	1,700
<b>Total Morocco</b>	<b>2.075</b>	<b>1,700</b>
<b>Total PVMTI</b>	<b>17.505</b>	<b>59,870</b>



### **Capacity Building and Technical Assistance May Be More Important than Business Finance**

At the time PVMTI was introduced, and for several years thereafter, the Kenyan market was not prepared for the financial product and services that PVMTI 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. Quality solar PV products and a reliable solar PV service network were also lacking in this 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.

### **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.

### **Product Quality Standards Are also Critical**

Many of PVMTI's investments found the lack of product quality standards to be detrimental to their operations. Muramati 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.

### **IFC's Typical Project Financing Requirements Are Ill-Suited to Small Business Transactions**

IFC's legal documentation and loan security docu-

### **WHAT WORKED AND WHAT DID NOT**

The PVMTI experience was similar to that of other solar PV projects undertaken by IFC and others, in that it highlighted that solar PV projects are most challenging to implement, precisely in those markets where the demand for it, and the economic justification for it, might be 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. The PVMTI experience also demonstrates that there is an ongoing need for capacity building and technical assistance, that investment terms and management of solar PV focused projects should be tailored to the specific needs of solar PV, and that product quality is a serious issue.

ments 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. 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 disbursement.

#### **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, 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.

#### **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 (Legal Department and Environment and Social Development Department) upon the recommendation of the EMT. This structure has resulted in significant delays in the administration process, as those closest to the projects (the EMT) were not making the decisions.

#### **CONCLUSION**

PVMTI has experienced considerably more success in India than in Kenya or Morocco. This success can be attributed, in large part, to the high population density in off-grid areas, the existence of established solar PV companies, and the relatively widespread knowledge about solar PV technology. In Kenya PVMTI had initially set out to provide working capital and end-user financing. However, the focus has since shifted to providing more technical assistance funding, particularly in the areas of training and quality assurance. In Morocco PVMTI has continued to rely on support from the national utility, ONE.

Given that PVMTI is still an operational project, it is difficult to come to any conclusions as to its overall performance. While the program started slowly, disbursements have increased significantly since the 2004 restructuring. With over \$12 million in disbursements, PVMTI is currently on track to meet the revised disbursement goals.

PVMTI was able to provide financing for a number of businesses that otherwise would not have been available. As a result of this financing, over 60,000 previously unelectrified households now have electricity. The Mid-Term Review, which was completed in July 2006, noted that PVMTI will be responsible for the displacement of an estimated 109,466 tonnes of CO<sub>2</sub> emissions over the lifetime of the SHS installed.

# MURAMATI DISTRICT TEA GROWERS SAVINGS AND CREDIT COOPERATIVE, LTD.

The Muramati District Tea Growers Savings and Credit Cooperative, Ltd. (Muramati), based in Kenya, was approved for financing from PVMTI in June 2000. The funding received was to support the introduction of a loan scheme to finance Muramati members in the purchase of SHS.

## BACKGROUND

Founded in 1993, Muramati has grown to be one of the largest savings and credit cooperatives serving the tea sector, with a current membership of over 32,000. Muramati's primary purpose is to provide basic savings and lending services to those involved in the tea sector in Kenya.

The concept for which the PVMTI funds were dedicated was relatively simple. Muramati would work in partnership with a local SHS supplier, which would supply and maintain the systems, while Muramati would market the systems and provide potential customers with the financing to purchase the systems. The customer would be required to pay a deposit on the system and maintain monthly payments.

## OBSTACLES

Progress on the project was initially quite slow, as both Muramati and the SHS supplier seemed to be waiting for the other party to drive progress. Under the initial agreement, the SHS supplier had agreed to establish infrastructure in Muramati's regions to service the SHS installed through the project, however, given the low volume of SHS orders, they were unwilling to make this investment and provided service from their headquarters in Nairobi, four hours away. This resulted in delays in installing new SHS, as the supplier would only install in batches, as well as in delays in responding to maintenance calls. A further issue resulted when the supplier received a faulty batch of batteries, causing a number of system failures. Finally, there was a problem with the

pricing systems. Muramati was assuming most of the financial risk in the arrangement, yet with tea prices having been stagnant over the past several years, tea growers were particularly aware of what constituted value for money, and the supplier's systems were seen as being particularly expensive.

An additional reason for the slow initial progress of the project was rooted in that Muramati only had to pay interest on drawn funds and, therefore, was in no great rush to proceed with the disbursements from IFC. Given this slow initial progress, PVMTI has had to restructure the terms of the Muramati loan, delaying the second and third disbursements, as well as the overall repayment schedule.

The credit terms initially offered by Muramati proved to be problematic. The short-term loan of up to 18 months proved to be far too short to ensure affordable repayment installments. Similarly, the 50 percent down-payment requirement proved too much for many potential borrowers, and the interest rates set at 15 percent per annum were considered too high.

No market survey, unfortunately, had been undertaken during the preliminary stages of the pro-



ject to determine the level of demand for SHS among Muramati members. Over the course of the program's implementation, it became evident that many Muramati members were taking out loans to purchase SHS on the open market, where they were available for a competitive price. While there was indeed a demand for SHS, this did highlight the fact that the driving factor in purchasing decisions was price, not quality, thus leaving the systems offered by Muramati at a distinct disadvantage.

At the time of financial closure, there were concerns about weak finances and internal controls. As a result, a rather cumbersome system of accounts was established to manage the flow of funds.<sup>36</sup> Today, Muramati continues to expand its membership and is in good financial health, despite the difficult conditions in the tea sector in recent years.

### MOVING FORWARD

Muramati eventually did engage a new supplier to provide systems at considerably lower prices than the original SHS supplier for the project. The issue of maintenance was addressed through the use of

grant funds from PVMTI, used to train local freelance technicians to perform ongoing maintenance of SHS. Credit terms offered by the cooperation were changed; the maturity of loans was increased to three years with a down payment no longer required; and interest rates were reduced to 12 percent per annum. These revised terms were, at the time, considered to be much more attractive to potential borrowers.

However, despite the above initiatives, the supplier partnership has failed to properly materialize, and Muramati no longer engages in such partnerships. Until 2006, Muramati continued to provide financing to its members to purchase SHS, although members were free to select the system and installer of their choice. During the last four years, Muramati has attempted to undertake marketing campaigns for SHS awareness to its entire membership. The results of this strategy have been limited. In late 2006, Muramati asked to halt its PVMTI program, and it has fully repaid its outstanding loan and unused grant funds. The company felt that the program was too cumbersome to manage and that it was ultimately outside its core business.

<sup>36</sup> IFC required that the disbursed funds to the Muramati project be held in a joint account (IFC and Muramati) at Barclays Bank in Kenya. Muramati was to draw down funds from this account only on approval from IFC. This process meant that Muramati had two steps to receive funds: 1) request a disbursement from IFC to the IFC/Muramati account, and 2) request approval of withdrawals from the jointly held account. This process could take four weeks or more.



# SREI INFRASTRUCTURE FINANCE, LTD.

SREI Infrastructure Finance, Ltd. (formerly SREI International Finance, Ltd.), is among the largest non-banking FIS in India. SREI is engaged in the financing of construction and mining equipment, infrastructure projects, and renewable energy systems. In February 2001, SREI received financing from PVMTI to address two key issues facing the Indian solar PV industry, namely, the lack of after-sales services and maintenance activities, and the lack of rural credit mechanisms.

## BACKGROUND

Although India has one of the world's largest solar energy programs, it still suffers from the same issues that face solar PV markets around the world: affordability and reliability of technology. The SREI project sought to address these issues by developing a financial model to provide unelectrified households with easy access to credit facilities in order to be able to access lighting options, and developing a network of solar service centers in the rural areas by building on the existing infrastructure of systems integrators.

The project involved a partnership between SREI (providing management and a financing mechanism for rural credit), Tata BP Solar India (India's largest solar PV cell and module manufacturer, which provided the SHS), The Ramakrishna Mission (an NGO with solar electrification experience and contacts with rural communities), and the Tata Energy Research Institute (TERI) (which brought project management and quality assurance experience).

## OBSTACLES

During the first few years of the project, implementation was impeded by significant disputes between the partners. The disputes centered around the initial anticipation that SREI would use loan funds to establish The Ramakrishna Mission infrastructure in rural areas in order to install and

maintain SHS. This endeavor never materialized, and eventually the partnership was dissolved.

SREI hoped to simplify operations and reduce costs by establishing a one-stop location where consumer credit, SHS and spare parts sales, and after-sales service and maintenance were fully integrated. The concept, unfortunately, did not materialize, due to the reluctance of SREI to establish rural infrastructure.

Initial attempts to establish a rural credit mechanism were unsuccessful. SREI was reluctant to take on rural consumer credit risk, despite its partial guarantee. During the early years of operation, sales were almost 100 percent cash and carry, and the issue was addressed by SREI providing supplier credit, establishing partnerships with rural banks for credit and, eventually, by the provision of consumer loans.

## MOVING FORWARD

Today, SREI continues to source solar modules from Tata BP in India, and is working with a new rural electrification service provider, Environ Energy-Tech Service, Ltd. (EETS). This new partnership has been in place for over two years and is considered to be progressing well.

PVMTI financing made it possible to provide EETS with working capital loans, enabling EETS to introduce several small innovations to enhance customer satisfaction, such as theft insurance, damaged parts replacement, regular visits by field technicians, and five years of free service.

The SREI experience presents an interesting case study. SREI focused on some of the more challenging areas of India, initially experiencing a great deal of difficulty. Currently, however, SREI performs well—the project has expanded beyond PVMTI to other projects—and it has installed over 15,000 SHS. Its experience highlights the need for patience, particularly in a challenging solar PV market.

# SUNLIGHT POWER MAROC S.A.

Sunlight Power Maroc S.A. (SPM), in Morocco, received PVMTI funding in December 2004. The funding was requested to finance infrastructure expansion and working capital requirements for a fee-for-service project, as well as to create a new credit business for solar PV sales.

## BACKGROUND

SPM was originally founded in 1998 to provide installation and maintenance of SHS in Morocco (primarily in the northern regions of Taza, Swfrou, Taounate, and El Khemisset). The original business model was based on a nonsubsidized fee-for-service rental scheme for SHS ranging from 20 to 80 WP. SPM would maintain ownership of the systems, and the households would pay a deposit followed by monthly fees, depending on the size of the system.

In early 2004, SPM signed an agreement with Office National de l'Electricité (ONE), to provide SHS under a subsidized fee-for-service scheme. The ONE scheme was established to provide solar PV electricity to the 15 percent of rural households (approximately 300,000) that are not targeted for grid connection. The scheme, established in 2002, has awarded six contracts for a total of 112,000 SHS.

Under the terms of the agreement, SPM was given exclusivity in the regions in which it was to install the ONE systems, and it was provided with a seven-and-a-half-year time frame to complete the installation. ONE pays SPM an upfront subsidy, and SPM undertakes the maintenance and repair of the system over a 10-year period, in return for a monthly fee paid by the end user.

When SPM applied for financing from PVMTI, the company had insufficient capital to meet leverage requirements. To overcome this obstacle, IFC considered historical equity contributions as cofinance to meet minimum leverage requirements, and PVMTI was able to recognize historical shareholder contributions that had funded the business prior to PVMTI involvement. As a result, no new cofinancing was

required for the project. As an exceptional case in the PVMTI portfolio, special approval had to be granted.

## OBSTACLES

A number of market issues impacted negatively on SPM's initial success. Firstly, significant grid expansion has taken place in recent years, shrinking the potential market for recipients under the ONE scheme. Secondly, ONE has significantly increased its subsidized fee-for-service scheme (which SPM benefits from), making credit schemes less desirable for the public and impacting sales. Thirdly, there is increased availability of cheap contraband solar PV modules in Morocco, putting pressure on prices and making potential sales margins significantly narrower.

SPM had a similar experience to other PVMTI projects relating to meeting the disbursement requirements. The cumbersome documentation process resulted in a two-and-a-half-year delay from IRC approval to financial closure.

## MOVING FORWARD

Despite the above obstacles, SPM has made significant progress under PVMTI, and continues to increase installations under the ONE scheme. SPM has attributed its ability to expand and establish three new service centers to PVMTI funding. It currently has installed approximately 6,000 SHS.

SPM has not yet managed to establish a credit business, as it has focused efforts on establishing the ONE business. Furthermore, SPM argues that consumers cannot yet afford the monthly credit payments and, therefore, it has not put forth the necessary effort to establish a credit business. Currently, no further efforts are being made to establish a credit scheme, as the company maintains its focus on installations under the ONE scheme.