PICO PV

Product Catalogue - 2015

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EUROPEAN MICROFINANCE PLATFORM
NETWORKING WITH THE SOUTH

e-MFP ACTION GROUP
ON MICROFINANCE
AND ENVIRONMENT

Description and Working Principle

Pico Photovoltaic (PV) systems are very small solar systems, but large enough to run very basic electricity needs of one household, ranging from 1 – 10 Watts of PV capacity. The systems focus on lighting, but can often also run other small electrical appliances such as mobile phone charging stations, radios, mp3 players, etc. and have the ability to extend the systems in parallel. Use of Pico PV systems allows for the substitution of traditional light sources such as kerosene or battery lamps. The equipment is versatile in regard to sales since it can be either sold over-the-counter, leased or used to sell or provide a service. Appliances, solar panels, connection boxes, cabling and battery are included with the equipment. Some systems include portable lamps with integrated batteries, such as the solar lanterns pictured here. Other systems are meant for stationary use.

Technical Characteristics

PV module	1 - 5 Watt, 5 - 12 Volt
Light output	10 – 800 lumens[1]
Runtime	4 – 13 hours depending on battery and intensity setting
Battery capacity	1000 – 5000 mAh (multiple hours to about one day of autonomy)
Battery type	Nickel-Metal-Hydride, Lithium Iron, Lithium Ion
Battery lifecycle	500 – 2000 cycles (1.5 – 5+ years)
Battery charging time	3 - 5 hours

Ease of Distribution, Installation and Maintenance

Products are typically complete systems including all necessary components, and are sold without or with very little need for installation. Compact packaging reduces complexity of distribution, and components that meet basic quality standards, such as those certified by Lighting Africa[2] (also coming Lighting Asia) have a proofed damage resistance.

The installation of the equipment varies depending on the type of technology. Compact Pico PV systems, with the solar module integrated, are 'plug-and-play' technology, not requiring installation. However installation is required when the panel needs to be fixed in order to adequately mount the panel frame, properly oriented and away from possible shadows.

Typical maintenance work on a regular weekly basis:

- Cleaning of the solar panel with soft cloth
- Ensuring full charging of the battery

Technology Options

Pico PV systems are offered as portable solar lanterns with integrated batteries or as fixed household systems. Options can include multiple lamps with up to five meters of cabling, mobile phone charging adapter kit, and in some cases, larger appliances such as small radios or televisions.

Price Range

Cost of a complete set-up is typically in the range of USD $5 - $50. Target market segments include households, farmers, fishermen, sundry shops and other small business owners.

Source: courtesy MEI; (top to bottom) Photos - Pico Lamp; Green Light Planet- SunKing Pro

Source: Kellie Jo Brown, Lighting Africa, 2012

Type of Financing

Microfinance loans for Pico PV systems are some of the most common microenergy loans. Pico PV systems carry small loan principles, and loan periods typically range from six months to one year.

Economic and Social Impacts for End-users

Solar lighting provides a clean way to reduce expenditures on other sources of inefficient lighting, providing savings effects and improved quality of life through increased lighting services and other basic electricity needs. Reduction of indoor air smoke due to offsetting kerosene has significant positive effects on the health and safety of the end-users and their families. In some cases, Pico PV systems have been shown to lead to income generation, such as offering minimal mobile phone charging services and enabling increased working hours with light.

Example: The break-even time depends on the price of fuel replacement and income generating activities of the size of the Pico PV. For example, SolarAid empowered a number of Tanzanian households with PV lamps, most of them without electricity access. Households reduced their expenses for lighting by 71 percent, by switching from kerosene to Pico PV lamps. At this level of savings, "the cost of a small study lamp is recovered in less than two months" (SolarAid, Africa).

Benefits for the MFI

MFIs can open and/or stimulate the market of Pico PV products by providing loans at different levels, depending on the electrification rate of targeted end-users. The substitution of other, more expensive, household lighting technologies can help customers to save money, improve their living standards, and increase the will to scale-up to larger, more powerful products. Also, a market for Pico PV products can be established in different sectors, such as education or agriculture.

Environmental Benefits

Environment: Pico PV can contribute to reduce waste production (such as dry cell batteries), particulate matter emissions (for example from kerosene), fire hazards and their impact on forests.
Climate change mitigation: Pico PV reduces greenhouse gas (GHG) emission: if it replaces one kerosene lamp it reduces 112 kg CO_2 emissions per year.
Climate change adaptation: Pico PV could reduce households' vulnerability to volatility and price increase of non-renewable fuels.
Potential positive synergies with: Childhood education awareness raising and programs[3].

1 800 lumens corresponds to a 60W incandescent bulb.
2 Lighting Africa minimum quality standards (http://www.lightingglobal.org/activities/qa/standards/)
3 For further information on potential synergies check the other product catalogues for EE and RE technologies.

European Microfinance Platform

The European Microfinance Platform [e-MFP] was founded formally in 2006. e-MFP is a growing network of 120 organisations and individuals active in the area of microfinance. Its principal objective is to promote co-operation amongst European microfinance bodies working in developing countries, by facilitating communication and the exchange of information. It is a multi-stakeholder organisation representative of the European microfinance community. e-MFP members include banks, financial institutions, government agencies, NGOs, consultancy firms, researchers and universities.

e-MFP's vision is to become the microfinance focal point in Europe linking with the South through its members.

e-MFP Microfinance and Environment Action Group

e-MFP Action Groups facilitate synergies among e-MFP members and encourage them to implement activities together, thus contributing to the advancement of the microfinance sector.

The aim of the e-MFP Microfinance and Environment Action Group is to bring together microfinance practitioners to discuss and exchange experiences in dealing with environmental issues and to create new practical tools to advance environmental microfinance. The Action Group is also intended to act as a think tank that disseminates its results among e-MFP members and the microfinance sector at large with a view to increasing the awareness of and commitment to act on these issues. It is meant both as an internal knowledge-sharing and external awareness-raising platform that serves as a reference in the microfinance sector.

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