



COMMUNITY PV

Product Catalogue - 2014

Prepared by MicroEnergy International GmbH
with the collaboration of Davide Forcella (CERMI-ULB)



EUROPEAN
MICROFINANCE
PLATFORM

NETWORKING WITH THE SOUTH

e-MFP ACTION GROUP
ON MICROFINANCE
AND ENVIRONMENT

Description and Working Principle

Community PV (Photovoltaic) is a solar power system that provides energy to the community, requiring either an individual investment or a community investment. An optimized site should be chosen and qualified skills and commitment are necessary to install and maintain the system. Community PV provides improved economies of scale and local job generation and also offers the potential to expand the participation to renters. After installation, relative low maintenance and a long lifetime is expected. Community PV is also good for the utilities because it aids power balancing. And during the agreed time period, there is no concern about increase in electricity price.

Technical Characteristics

Target group	Community in islands, rural areas without grid connection or with unstable grid connection
Components	PV Panel, charge controller, inverters, battery, wiring, measuring and monitoring devices, data storage
Fuel type needed	Solar irradiation
PV Array size	500W – 2kW
Battery capacity	210Ah – 850Ah
Battery type	Lead acid, Li-Lon, Ni-MH
Battery lifecycle	200-1500 at 80% Depth-of-Discharge (DOD) for lead acid* 1000 cycles at 80% & 3000 cycles at 20% for Li-Lon and Ni-MH**
Battery charging time	Within 5 hours
Autonomous Days	3 days (depending on design)
Life time	PV Panel: 20 years, battery (see battery lifecycle above), Power Electronics 5-10 years.
Operation	Unattended, during daylight hours

source: *: IEEE 1562-07(1) /IEEE 1361-03 (2) **: NEPQA-2013

Ease of Distribution, Installation and Maintenance

Detailed research must be carried out to determine the requirement and system sizing. Site selection and resource evaluation are required. Damage to all the components must be avoided during the distribution process.

Installation at this scale requires skilled technicians. Multiple panels in an array must be connected in series, parallel, or a combination of series-parallel to meet both the voltage and amperage requirements of the power electronic inverter/controller. Typical maintenance work includes:

- Failure check
- Data measurement
- Remote monitoring
- Data collection
- Cleaning the solar panel surface

Technology Options

The available technology option is Grid-Connected and Off-Grid Community PV. Grid-Model Community PV indicates that the utility is involved and the Community PV is connected to the grid. Off-Grid-Model Community PV is a stand-alone model, in which the Community PV is not connected to the grid. These two models will result in different business models. In both cases, Virtual Net Metering Technology will result in different business models. In both cases, Virtual Net Metering Technology will be implemented to monitor the energy generated by the Community PV and the energy delivered to each end-user. In case of Grid-Connected, the energy delivered to the utility will also be monitored.

Price Range

The system price depends largely on the size of the system and the battery is the main determinant of the price. The price range varies from USD \$2400 - \$7800 for a size of 600W – 2KW. (Data based on Solar Mosaic 2012).

Type of Financing

Community PV of this scale could be offered through microfinance loans direct to the individual investors. The electric energy allocated to each participant is proportional to his investment and based on consumption. The loan will be paid back through electricity sales. (e.g.: selling to utility, cell phone charging fees).

Economic and Social Impact for End-users

Community PV provides reliable on-site electric energy access for the whole community thus improving the quality of community life and the possibility of local job generation as technicians are needed to install the whole system and carry out routine maintenance as well as monitoring.

The payback time depends largely on the parameter of the electricity tariff. Example: Solar Mosaic has a project for a Youth Employment Center in Oakland since 2012 and the loan period is 5 years. In other words, USD \$200 investment will turn into USD \$272 at the end of the 5-year period.

Benefits for the MFI

Compared to normal Solar Home System (SHS), Community PV provides a better economy of scale. The repayment of the loan can be ensured at this scale and MFIs can extend the participation of people who are not the legal owners of a house to install the PV Panel and help to improve the quality of community life.

Environmental Benefits

Environment: it reduces particulate emissions and pressure on natural resources used to produce electricity. It reuses wasteland and it reduces waste coming from dry batteries and leakages from kerosene or diesel.

Climate change mitigation: it reduces greenhouse gas emission.

Climate change adaptation: it reduces the vulnerability to electricity and fuel price volatility, and it reduces the vulnerability to volatility in energy provision.

Potential positive synergies with: efficient air conditioner, energy efficient refrigerator.¹



Source: MicroEnergy International

¹ 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 over 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.

Head of the Action Group: MicroEnergy International GmbH, www.microenergy-international.com

European Microfinance Platform

39 rue Glesener
L-1631 Luxembourg
Tel: +352 26271382
contact@e-mfp.eu
www.e-mfp.eu

With the support of



THE GOVERNMENT
OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of Foreign and European Affairs



THE GOVERNMENT
OF THE GRAND-DUCHY OF LUXEMBOURG
Ministry of Finance

Directorate for Development Cooperation
and Humanitarian Affairs