

## **Pre-qualification guidelines for Solar suppliers** **(Component-based solar home systems & Solar Irrigation Pumps)**



PMIC – KFW Renewable Energy Initiative through  
Microfinance (PRIME)

June 2023

# Table of Contents

Introduction .....	3
Benefits for MFPs and Solar Suppliers .....	3
Expectations from qualified solar suppliers .....	4
Objective of this call for application .....	4
Technical Requirements for Product Eligibility .....	5
Solar Modules .....	5
Solar Charge Controllers.....	5
Inverters.....	6
Batteries.....	6
Cabling .....	7
Pump controller .....	8
Additional mandatory requirements (Soalr Irrigation pumps) .....	8
Warranty .....	8
Qualified Company Requirements .....	9
Financial and operation requirments .....	9
Company Technical Requirements.....	10
Installation of Systems.....	10
Number of Installers per Company .....	10
Installer Qualification and Experience Requirements for Low Voltage system installations; .....	10
Information to be provided about the Installers.....	11
Application Process .....	11
Processing by PMIC.....	12
Processing of the Installer Application by PMIC Consultants .....	12
Application Period and Deadline for applications .....	12
Clarifications .....	12
Application language.....	12
Address for submission .....	12
Announcement of results .....	13
Application Form - General Information about Company .....	14
Installer Information .....	14

## Introduction

Pakistan Microfinance Investment Company Limited (PMIC) is registered as an Investment Finance Company under NBFCs regulations with Securities and Exchange Commission of Pakistan. It is setup jointly by, Pakistan Poverty Alleviation Fund (PPAF), Department for International Development (DFID) through Karandaz Pakistan and the German Development Bank (KFW) to catalyze and lead the next phase of growth in the microfinance sector of Pakistan. The purpose of the organization is to provide a wide range of financial services, including wholesale funding to microfinance institutions and microfinance banks to promote financial inclusion in Pakistan to alleviate poverty and contribute to broad based development.

Pakistan Microfinance Investment Company (PMIC) and German Development Bank – KFW has launched a program in Pakistan in August 2019 that aims to support the financing of Lighting Global Quality verified Pico PV and Solar Home Systems packaged with appliances for households in poor grid and off-grid locations in the rural and peri-urban areas of Pakistan. An amount of Euro 15 million is earmarked for lending to MFIs ensuring delivery of a responsible financing mechanism. A technical assistance support of Euros 1 million to build capacity of MFPs and other stakeholders is also part of the program.

To facilitate affordability and remove barriers to financing for end clients purchasing solar solutions for rural households, small businesses and irrigation, the program activities will include:

- ✓ **Pre-qualify** solar suppliers & products; set & enforce quality standards for solar products & services;
- ✓ **Assist** MFPs in designing consumer loan product; formalize MFP-qualified solar supplier relationships & support smooth collaboration;
- ✓ **Provide** trainings to MFP's credit officers and qualified solar supplier's sales agents to equip them with the required product knowledge and refine their sales skills.
- ✓ **Raise** awareness among rural households and in MFP branches to ensure uptake of quality certified solar products & microfinance;
- ✓ **Provide** technical guidance to environmental improvement on battery and electronic waste recycling support.

Pakistan Microfinance Investment Company (PMIC) is responsible for the coordination of all program activities, including the pre-qualification of solar suppliers and their products; on-going quality control; consumer awareness for demand generation, trainings and collaboration with all program stakeholders for effective delivery.

## Benefits for MFPs and Solar Suppliers

Microfinance Providers (MFPs) benefit from participation in the Program in numerous ways, including wholesale financing from PMIC dedicated to solar loans, business relationships with qualified solar suppliers to offer consumer financing products for high quality solar products offered by pre-qualified solar suppliers; a quality assurance framework that guarantees high quality solar products and a full range of customer satisfaction services; promotional activities, and mass

media communication for solar loan products; access to market intelligence; technical assistance for solar loan product design and access to training for credit officers.

Qualified solar suppliers benefit from participation in the Program in numerous ways, including business relationships with MFPs to offer consumer financing products for certified solar products; business development support through consumer awareness raising campaigns; and mass media communication for quality certified solar products; facilitate access to vendor financing (trade finance); access to training and business development services; access to MFPs existing clients and outreach; and access to market intelligence.

## Expectations from qualified solar suppliers

Most of the solar systems to be sold under the PRIME target end users in poor grid mostly peri-urban areas and off-grid locations in the rural areas of Pakistan. To reach them, qualified solar suppliers are required to make investments in distribution logistics, collaboration with MFPs, after sales service provision through local community technicians, trainings of MFP credit staff on product features and assist MFPs in awareness raising/promotion activities.

The program intends to promote the following product categories.

1. **Lighting Global/VeraSol verified solar products** that are tested in accordance with IEC TS 62257-9-5 & 8.
2. **DC Component based solar home systems** up to 500 watts packaged with DC fans
3. **AC Component based solar systems** up to 3kW for housing and up to 5kw for productive-use appliances.
4. **Solar Irrigation Pumping solutions for water pumps up to 10 HP**

The Program also encourages partnerships between qualified solar suppliers and MFPs. Solar financing will lower the initial investment barrier in solar PV products for rural households and MFP clients. Solar suppliers can leverage the trust MFPs have already developed with existing borrowers, and also take advantage of MFP's established rural outreach network. Suppliers and MFPs need to dedicate time and resources to ensure efficient coordination of promotional activities, the loan application process, loan disbursement and product sales, and payment collection and after-sales services.

## Objective of this call for application

The objective of this call for application is the pre-qualification of solar suppliers to operate under PRIME that can provide AC/DC Component based solar solutions with/without inverter for housing and productive use appliances and Solarization of water pumps for irrigation up to 10 HP.

Qualified solar suppliers commit to comply with the technical and performance standards established by the PMIC's PRIME Program; and their application for pre-qualification set out a plan for their performance in the Program.

In particular, the application process assesses the Solar suppliers' (a) experience and current business performance, including market share and capacity of their rural distribution network, (b) commitment and current approach to delivering high quality customer services, (c) current target group, understanding of customer needs, and willingness to cater to a target group that may require loans from an MFP in order to make an investment in a solar product, (d) current approach to business planning, increase sales levels / expand business operations and; (e) ability to achieve targets.

## Technical Requirements for Product Eligibility

Both imported and locally assembled products can be used if they comply with the below mentioned Minimum quality and performance standards. For locally manufactured solar modules and inverters conformity testing to be done in the labs of NED University, Karachi or University of Engineering and Technology (UET) Lahore to ensure that the components conform with the minimum quality standards mentioned in this document.

### Solar Modules

Solar modules shall meet either the relevant following design qualification and type approval standards

- IEC 61215 Terrestrial photovoltaic (PV) modules - Design qualification and type approval and
- IEC 61730 Photovoltaic (PV) module safety qualification

Each module shall be marked with a serial number with the purpose of providing traceability to the manufacturer's name, factory, and date of manufacture.

The module label must show the correct Certifier Mark (logo) corresponding to that on the test certificate supplied at the time of approval.

If the certificate/test report on which the listing was based becomes invalid, then the Qualified Supplier must supply a new certificate for the module or cease using that in the systems supplied under PRIME program.

Locally manufactured PV modules shall at least comply with the above standards. Conformity testing to be done in the labs of NED University, Karachi or University of Engineering and Technology (UET) Lahore to ensure that the components comply with the above-mentioned IEC standards.

### Solar Charge Controllers

The controllers shall either meet one of the standards listed below or one of the markings listed below.

Standards include:

- IEC 62509 Safety of power converters for use in photovoltaic power systems
- IEC 62509-1 Part 1: General requirements
- UL Standard 1741: Standard for Inverter, converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources

Markings include:

- Underwriters Laboratory (UL) Listing and Classification Mark
- Conformity European (CE) marking

In addition to meeting the requirements of the above referenced standards, each controller shall be marked with a serial number with the purpose of providing traceability to the manufacturer name, factory and date of manufacture.

Locally manufactured charge controllers shall at least comply with the above standards. Conformity testing to be done in the labs of NED University, Karachi or University of Engineering and Technology (UET) Lahore to ensure that the components comply with the above-mentioned IEC standards.

## Inverters

The inverters shall meet one of the following two options:

1. IEC 62109 Safety of power converters for use in photovoltaic power systems
  - IEC 62109-1 Part 1: General requirements
  - IEC 62109-2 Part 2: Particular requirements for inverters
  - IEC 61683
  - IEC 62116
  - IEC 61727
2. UL Standard 1741: Standard for Inverter, converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources

The inverters shall be rated to provide an a.c. voltage within the range of 220V and 240V

In addition to meeting the requirements of the above referenced standards, each inverter shall be marked with a serial number with the purpose of providing traceability to the manufacturer name, factory and date of manufacture.

## Batteries

### a. Sealed Lead Acid – SLA battery

Parameters	Minimum specifications required
Battery Make. Performance guarantee 3 Years Replacement Warranty 18 months or more Brands Renowned and Verifiable	Shall be verifiable
Battery Type	AGM/Gel/OPzS/OPzV
Battery Capacity (Ah)	65 Ah- 150 Ah 12 V @ 10hr discharge or better
Battery Life	~700 - 800 @ 50% DoD, 3~10 HR discharge
Self-Discharge	The maximum permissible self-discharge rate is maximum 4% percent of rated capacity per month at 25°C, certified compliance of EN 60896-21
Relief Valves	Self-regulating pressure relief valve
Operating temperature	-15o C ~ 45oC (Be within 2% of the operating time up to max. 50°)

Batteries tested and certified	Compliance with all applicable standards that may includes IEC60896-21/22, ISO9001(TUV), DIN43539-T5, IEC61427, DIN40742-773-774, DIN 40736, CE, TL, Storage Standard GB/T 22473
Manufacturing Date	Max. four Months (Evidence required)

**b. Lithium batteries (LiFePO4)**

- Cycle life of the **LiFePO4** battery (12V) before 80% capacity of initial capacity shall be minimum 3000 cycles @ 50% depth of discharge at discharge rate of 10 hours
- The **LiFePO4** battery must have battery management system (BMS) to ensure battery safety and reliability
- The **LiFePO4** battery shall have LED status and alarm indication
- The charge and discharge rate of the battery shall be designed at .2C minimum but capable of handling .5C charge and discharge currents.

## Cabling

1. All exposed wiring (with the possible exception of the module interconnects) must be covered in conduits/duct. Wiring through roofing, walls and other structures must be protected through the use of bushings. Wiring through roofing must form a waterproof seal (applicable for wiring only).
2. For conduit and duct flexible PVC material with ½ inch size must be used.
3. Field-installed wiring must be joined using terminal strips or screw connectors. Soldering or crimping in the field must be avoided if possible. Wire nuts are not allowed. The rated current carrying capacity of the joint must not be less than the circuit current rating. All connections must be made in junction boxes. Fittings for lights, switches, and polarity sensitive socket outlets may be used as junction boxes where practical.
4. All wiring shall be colour coded and/or labelled.
5. Installation including wiring shall meet the requirement and recommendations given in 8.3 of IEC 62124 ed 1.
6. No conduit or fitting shall be attached directly to thatch or any other non-supportive surface.
7. Especially avoid installing the conduit direct over the roof; there must be distance not less than 1 inch between the roof surface and conduit/duct.
8. Cables must be joined by the use of junction boxes, screw-connectors, and block connectors.
9. All wires must be terminated with proper end sleeves and wire thimbles with different colors for positive and negative polarity.

10. Field installed wiring must be joined using terminal strips or screw connectors. Soldering or crimping in the field must be avoided if at all possible. Wire nuts are not allowed.
11. The rated current carrying capacity of the joint must not be less than the circuit current rating.
12. Fittings for PV, lights and battery must be with polarity sensitive socket outlets to avoid short circuiting.

## Pump controller

- Controller may be of VFD/Fixed frequency operated;
- The controller may have MPPT technology;
- The maximum allowable restarting time must be less than 120 seconds;
- It is recommended that the pump shall not start below 70 % of the rated voltage of motor;
- Controller having a minimum protection of IP20 may be allowed if it is enclosed by a controller box having a minimum protection of IP41. If the controller itself has an IP 41 protection, then no control box will be necessary;
- The controller should have short circuit and overload protection;
- Controller must have a minimum efficiency of 90 % at rated frequency;

## Additional mandatory requirements (Solar Irrigation pumps)

- a. Loans shall only be provided in areas where groundwater levels are not depleted, or where surface water is available for irrigation.
- b. Financing shall only be deployed in lands that remains flood free during annual inundations and areas with no arsenic contamination in the groundwater.
- c. Financing shall only be limited to existing bore holes only. **No financing shall be provided for new bore holes.**
- d. The capacity of water pumping using solar power shall not exceed the capacity of pumping using diesel generator.
- e. Use of large water storage tank shall be encouraged.
- f. MFPs shall provide funds bearing 80% of the cost of the installation. 20% to be borne by the farmer.
- g. Farmers and landowners having less than 12.5 acres of agricultural land shall be eligible.
- h. The validity of this financing shall be limited to the farming land where sub terrene water is 50 to 100 feet below the surface.

## Warranty

AC/DC Component based solar home system: Two years comprehensive repair and maintenance warranty at site (free of cost) shall be provided for all system components.

The photovoltaic modules shall be warranted to provide their rated output at standard conditions within  $\pm 10\%$  for a minimum of 10 years under the operating conditions at the sites. The modules shall be warranted against physical defects for a period of at least 5 years following installation.

The battery, solar controller (PWM or MPPT) and inverter shall each have a minimum 1-year comprehensive warranty.



The Pumping controller shall have 2 years warranty.

The responsibility to carry and honour these warranty provisions is borne by the Qualified Supplier and applies even if the product manufacturer fails to honour the warranty and/or the supplier manufacturing the product no longer exists.

## Qualified Company Requirements

### Financial and operation requirements

- Applicant Company is officially registered with Federal Board of Revenue (FBR) Pakistan, or his business is registered with Pakistan Tax Network and has a valid NTN.
- Applicant Company has at least 02 years of experience distributing solar PV products, and at least 01 year experience in distributing solar PV products in rural areas of Pakistan. Joint ventures or Consortium are also eligible.
- Applicant company must have an office in Pakistan preferably in the Punjab and Sindh provinces and is willing to establish at least three (3) sub-offices/ dealerships/ after sales service centers at selected Divisional headquarters in these provinces;
- Applicant company shall provide;
  - List of staff members who have relevant experience, especially pertaining to solar PV.
  - List of projects or system installations for which they have previously supplied solar equipment and/or list the number of solar products provided under previous programs or sold directly to end customers.
  - Description of warranty and after-sales service procedures.
  - List of all their regional outlets; retailers, distributors.
  - Nominate at least one person who will be the contact person for PMIC and MFPs. This person will take responsibility for the company meeting all the requirements specified in this document and be the person formally authorised to answer any questions regarding the application. The Applicant Company shall provide organisational details of their business to show where this person is positioned within the existing management structure and to include the name and position of at least one alternate contact person.
  - Information on their complaint procedure (if one exists).
- Applicant company has a proper implementation procedure of an after-sales service program that repairs/replaces equipment that is covered under the warranty on no fee charged basis. Fee-based service must also be available for repair/replacement of components after expiration of the warranty.
- Applicant company shall have an implementation of an electronic waste (e-waste) management procedure, in particular a strategy for used battery disposal. As a minimum the e-waste management procedure will ensure safe collection and safe disposal or recycling of the provided system components once they are no longer in use. In this context safe means

that there are no detrimental effects to human beings or to the environment during the stated procedures.

## Company Technical Requirements

Qualified company shall only use components within their solar solutions that have been tested and certified against the required standards that are specified in this section..

The Applicant Company shall provide:

- A list of all the different brands/models of products that they will use as components within their component based solar home systems;
- Provide brochures for the different products and models; and
- Provide the test certificates from a testing laboratory accredited to ISO/IEC 17025 **General Requirements for the Competence of Testing and Calibration Laboratories** verifying that the product meets the specified standard.
- Provide conformity testing reports for locally manufactured products done in the labs of NED University, Karachi or University of Engineering and Technology (UET) Lahore to ensure that the components comply with mentioned minimum quality standards for each product.
- Provide if any, agreement/ purchase order/ dealership/ MoU executed with the supplier/manufacturing company.
- Product warranty/replacement terms .

## Installation of Systems

The Qualified Company shall employ or sub-contract installers responsible for the installation of CB-SHS and Solar Irrigation Pumps (SIPs). Installers are then pre-qualified by PMIC according to process mentioned in this section. Solar Installers shall install CB-SHS and SIPs in accordance with the “Solar Home System and Solar Irrigation pump Installation Guidelines” and “Product data sheet” approved by PMIC. A testing and commissioning sheet approved by PMIC shall also be provided with every system installation. The information required in the testing and commissioning sheet is the minimum that shall be included in any test certificate developed by a Qualified Company.

## Number of Installers per Company

Three installers from each Applicant Company will be assessed by the PMIC consultant. A Minimum of two from each Applicant Company must pass the assessment and be approved as installers under the quality assurance framework. The Qualified Company will be held responsible if the system installation does not meet those guidelines.

## Installer Qualification and Experience Requirements for Low Voltage system installations;

For an installer with systems having system voltage equal to 50VDC and above, the installer shall meet the following pathway:

- Been a solar home system installer for a minimum of two years;

- Undertaken in-house training or attended a third-party training course(s) on solar home system or solar irrigation pumps design and installation; and
- Holds the Vocational training certificate provided by any recognized authority; and
- Undertaken and passed a solar training conducted by Program Implementation Consultant

## Information to be provided about the Installers

Each Applicant company shall provide the following information:

- A letter from the Applicant company, on company letterhead stating when the installer started working for the company as an installer;
- How many (approximately) component-based solar home systems they have installed and the range of sizes?
- A list of all the educational certificates/degrees and courses they have attended including copies of any certificates they have received.
- Information on three different sized systems they have installed. If available, include photos of some of the installed systems.

## Application Process

An Applicant Company to be eligible to apply for PRIME program shall complete the Company Application Form provided given at the end of this document. This form is divided into 4 parts:

- Part 1: General Information
- Part 2: Company Documentation
- Part 3: Installer Information
- Part 4: Letter of Interest
- Part 5: Declaration regarding e-waste management

All the information requested in this form must be provided with the application bid.

The form is provided as a Word document and an applicant must submit the application in the same order as shown on the form and must respond to all questions in each section.

The application shall be submitted electronically at [faheem.khalid@pmic.pk](mailto:faheem.khalid@pmic.pk). The applicant firm can send the:

1. Soft copy of the bid via email (if the attachment size is less than 10 MB)
2. Soft copy through an online link – shared in an email – with expiry time of at least 24 hours
3. Hard copy of the bid via post

The hard copy of the application could be submitted at following address:

### Head of Sector Development

Pakistan Microfinance Investment Company

Tel: +92 51 84 87 820

Ufone Tower, Blue Area

Islamabad

Pakistan

## Processing by PMIC

Once an application by an Applicant Company to be technically approved for eligibility to supply CB-SHS and SIPs to MFPs has been received, the PMIC shall provide the application to its Technical Committee within 2 working days of receiving the application. The Technical Committee will complete the verification checklist as provided in Section 10. The verification process involves:

1. Confirming that the application form is complete
2. Confirming that the installers meets the eligibility requirements
3. Confirming the Applicant Company's contact person has been specified.

Each review will take between 1 to 2 days to process subject to the number of applications submitted to the PRIME Technical Committee. The Committee shall undertake the review and submit the verification checklist within 5 to 10 working days after receiving a completed application.

The checklist includes an area for stating why a company was not yet eligible and what needs to be done for acceptance of the application.

## Processing of the Installer Application by PMIC Consultants

With respect to the Applicant (or Approved) Company's installers, PMIC can then inform the Applicant (or Qualified) Company which installers have been approved.

## Application Period and Deadline for applications

The application period for solar suppliers to seek pre-qualification under the PRIME Program opens **19 June 2023** and closes on **18th July 2023 at 5:00pm Pakistan Standard Time (PST)**. Please note that any application received after the deadline shall not be considered.

## Clarifications

Any questions or clarifications regarding this call for application should be addressed to [lbrar.khattak@pmic.pk](mailto:lbrar.khattak@pmic.pk) by **30th June 2023 at 5:00pm**. A document consisting of response to all clarifications will be sent to email addresses of all the applicants by **5<sup>th</sup> July 2023**.

## Application language

Only applications filled in the English language will be accepted.

## Address for submission

Completed applications using the forms provided must be submitted **electronically** to [faheem.khalid@pmic.pk](mailto:faheem.khalid@pmic.pk) or via post at the above designated address. Applicants will receive an acknowledgement of receipt. Please note that hard copies of the applications shall also be sent on the following mailing address by **19th July 2023 at 5:00pm Pakistan standard time**;

**Head of Sector Development**

Pakistan Microfinance Investment Company (PMIC)  
21st Floor, Ufone Tower, 55 C,  
Main Jinnah Avenue, Blue Area,  
Islamabad 44000, Pakistan  
Tel: (+92-51) 8487820-45

**Announcement of results**

All applicants will be informed about the result of their application by **22nd July 2023**.

## Application Form - General Information about Company

COMPANY APPLICATION FORM	
Name of Company	
Physical Address of Main Office/Shop	
Postal Address (if different)	
Website	
Name of Contact	
Position	
E-mail	
Phone	
Mobile Phone	
Name of Alternate Contact	
Position	
E-mail	
Phone	
Mobile Phone	
List any registration that company might have and the date of their expiry	
Information on your number of staff	
Number of outlets/branch offices/distributors	

## Installer Information

Application by Experienced Installer			
Name of Installer			
Name of Company			
Letter is provided from company stating how many years you have been an installer with the company.			
How many systems (approximately) have you installed?			
Based on the size of the solar array: What has been smallest system (and what has been the largest system you have installed.	From Wp	Wp to	
List the Training Courses the Installer has completed? <i>Please attach any certificates or documents verifying that the courses were undertaken</i>	Course	Year	Certificate Attached (tick)

[Print on company letterhead]

[Date]

**Pakistan Microfinance Investment Company (PMIC)**

21st Floor, Ufone Tower, 55 C,  
Main Jinnah Avenue, Blue Area,  
Islamabad 44000, Pakistan  
Tel: (+92-51) 8487820-45

***Subject: Letter of Interest - PMIC -KFW RE Initiative Through Microfinance (PRIME)***

Dear Sir / Madam,

On behalf of [name of company] I would like to express our interest to participate in PRIME Program which we understand aims to support the financing of Solar home systems for households, solar solutions for small businesses and irrigation pumps in poor grid mostly peri-urban areas and off-grid locations in the rural areas of Pakistan.

At [name of company] we are involved in the distribution of solar based solutions to off-grid and poor grid households in Pakistan. We are very much interested in collaborating with PMIC and their partner MFPs in the implementation of this program.

Please do direct all correspondence related with PRIME program to the following individual(s):

Name:

Position:

Email:

Phone Number:

Sincerely,

Print on company letterhead]

[Date]

**Pakistan Microfinance Investment Company (PMIC)**

21st Floor, Ufone Tower, 55 C,  
Main Jinnah Avenue, Blue Area,  
Islamabad 44000, Pakistan  
Tel: (+92-51) 8487820-45

***Subject: Declaration regarding E-waste management plan***

Dear Sir,

We declare that the procedures for the management of electronic waste generated from our solar system business shall be implemented. In particular, this will include the safe disposal or recycling of batteries and system components. The replacement of old Lithium-ion and lead acid batteries with new ones will not be done without collecting the former. We will collect the old batteries from the customer and safely dispose them off as per PMIC's proposed plan.

Sincerely,

CEO

Director