



**សុន្ទរណ៍**  
GOOD SOLAR INITIATIVE

**Amendments**  
**to**  
**Quality Charter Version: Feb 2015 (v1.0)**  
**Effective from 01 November 2017**



<b>Version History</b>	
<b>Current Quality Charter version effective:</b>	<b>Original Version first released Feb 2015 (v1.0)</b>
<b>Previous Amendment #:</b>	<b>3</b>
<b>This Amendment #:</b>	<b>4</b>
<b>Amendment Approved:</b>	<b>27 April 2018</b>
<b>Amendment Effective from:</b>	<b>01 November 2017</b>
<b>Amendment Justification:</b>	In order to better respond to the energy needs from Cambodian rural poor, the Green Microfinance Program (GMP) proposes to include solar PV product-based innovations within the <i>Good Solar™ Initiative quality assurance framework</i> . The Quality Charter will include a new product subcategory for solar systems with either a smart PAYG controller, or a built-in inverter, or specifically tailored for DC productive use appliances. The so-called “Innovative Solar Home System +” (SHS+) approved products will therefore become eligible for the MFIs solar loans from the GMP partner MFIs.

**Quality Charter section reference: 2**

**Replace with:**

*“2 System Components Standards for SHSs and SHSs+*

*Accredited suppliers sell only high quality, safe, efficient, user-friendly and long-lasting solar system components for Solar Home Systems (SHSs) and for Innovative Solar Home Systems (SHSs+). The Innovative Solar Home Systems (SHSs+) subcategory covers solar PV products including either a smart PAYG controller, a built-in inverter, or specifically tailored for DC productive use.”*

**Quality Charter section reference: 2.1 to 2.1.7**

**Replace “Solar Home Systems” with “Solar Home Systems (SHSs) and Innovative Solar Home Systems (SHSs+)”**

**Quality Charter section reference: 2.1.1**

**Replace with:**

*“2.1.1 Solar Panel*

*Accredited Solar Home Systems (SHSs) and Innovative Solar Home Systems (SHSs+) include one or more certified Solar Photovoltaic Panel with guaranteed output and manufacturer warranty, as defined below:”*

**Quality Charter section reference: 2.1.1.2**

**Replace with:**

*“2.1.1.2 Performance required for solar panels are:*

- *Minimum amount of 36 cells for crystalline panels and 29 cells for amorphous panels;*
- *Minimum 10 years product warranty;*
- *Minimum 25 years performance warranty (90% power output guaranteed for the first 10 years, 80% for 25 years);*
- *Peak Power between 20Wp and 300Wp.”*

**Quality Charter section reference: 2.1.2**

**Replace with:**

*“2.1.2 Battery*

*Accredited Solar Home Systems (SHSs) and Innovative Solar Home Systems (SHSs+) include one or more certified, safe Deep-cycle Battery with manufacturer warranty, as defined below:”*

**Quality Charter section reference: 2.1.3**

**Replace with:**

### *“2.1.3 Charge Controller*

*Accredited Solar Home Systems (SHSs) and Innovative Solar Home Systems (SHSs+) include a Charge Controller with pre-set or adjustable settings that allow for optimal harvest from the Solar Photovoltaic Panel and optimal charge and discharge of the Battery, as defined below:”*

#### **Quality Charter section reference: 2.1.3.4**

##### **Replace with:**

*“2.1.3.4 Documentation for Charge Controller confirms:*

- *Factory quality standard compliance: ISO 9001:2008 (mandatory for SHS subcategory); or*
- *Performance testing from an independent laboratory; or*
- *Remote smart communication enabled to allow live performance monitoring;*

#### **Quality Charter section reference: 2.1.4**

##### **Replace with:**

*“2.1.4 LED lights*

*Accredited Solar Home Systems (SHSs) and Innovative Solar Home Systems (SHSs+) include at least 02 LED Lights with guaranteed output, as defined below, but LED lights are not mandatory for Innovative Solar Home Systems (SHSs+) for DC productive use:“*

#### **Quality Charter section reference: 2.1.5**

##### **Replace with:**

*“2.1.5 Additional mandatory components*

*Accredited Solar Home Systems SHSs) and Innovative Solar Home Systems (SHSs+) include a set of additional mandatory components to ensure the highest possible level of safety and installation quality, as defined below:”*

#### **Quality Charter section reference: 2.1.6**

##### **Replace with:**

*“2.1.6 Additional optional DC appliances – and special case for SHS+ for productive use*

*Accredited suppliers are strongly encouraged to promote Solar Home Systems (SHS) and Innovative Solar Home Systems (SHSs+) with bundle that include system-appropriate DC appliances (such as TV, DVD player, fan, radio, music system, mobile phone charger, etc.). DC appliances sold as part of a bundle require review from the Good Solar Initiative to ensure they can be powered sufficient time per day. Accredited suppliers are encourage to offer a 2 years warranty on any appliance sold as part of a Solar Home System.*

*Considering the growing demand for productive use application of solar energy in rural Cambodia, mostly for Agriculture, Innovative Solar Home System (SHSs+) can include productive use appliances as defined below, as one of the potential product-based innovation option:*

*2.1.6.1 Eligible DC appliances for productive use technologies include:*

- *Equipment for water pumping; or*
- *Equipment for agro processing and storage; or*
- *Equipment for other productive use (tailoring, workshop, haircutting);*

*2.1.6.2 Performance required for DC appliances for productive use are:*

- *Minimum 2-year product warranty;*

*2.1.6.3 Permanent DC appliances for productive use label by the manufacturer includes the following information (as rated under Standard Test Conditions):*

- *Brand and Model;*
- *Nominal power, rated Voltage and Maximum Current;*
- *Maximum service output;*

*2.1.6.4 Documentation for DC appliances for productive use confirms:*

- *Factory quality standard compliance: ISO 9001:2008; or*
- *Performance testing from an independent laboratory; or*
- *Remote smart communication enabled to allow live performance monitoring;*

#### **Quality Charter section reference: 2.1.7**

##### **Replace with:**

*“2.1.7 Inverters and AC appliances – and special case for SHS+ with built-in inverter*

*To ensure optimal Solar Home System performance, accredited suppliers discourage the use of AC appliances in combination with inverters and inform end-users about the importance of using DC appliances for higher efficiency.*

*However, Innovative Solar Home Systems (SHSs+) with built-in inverters include an integrated inverter as defined below:*

*2.1.7.1 Eligible built-in inverter technologies include:*

- *Off-Grid Pure Sine Wave Inverters;*
- *Grid ready Pure Sine Wave inverter, including battery charger ;*

*2.1.7.2 Performance required for built-in inverter are:*

- *DC Input panel up to 500Wp*
- *DC Input battery 12VDC or 24VDC*
- *AC Output 230VAC +/-5%, 50Hz*
- *DC Output 12VDC*
- *Optional AC Input 230VAC +/-5%, 50Hz*

*2.1.7.3 Permanent built-in inverter label by the manufacturer includes the following information (as rated under Standard Test Conditions):*

- *Brand and Model;*
- *Nominal DC input: Maximum power, rated voltage and maximum current;*
- *Nominal AC output: Rated power (VA), voltage, frequency, and efficiency;*
- *Nominal DC output: Rated voltage and maximum current;*

*2.1.7.4 Documentation for DC appliances for productive use confirms:*

- *Factory quality standard compliance: ISO 9001:2008; or*
- *Performance testing from an independent laboratory; or*
- *Remote smart communication enabled to allow live performance monitoring;*

### **Quality Charter section reference: 2.1.8**

#### **Add:**

*"2.1.8 Automatic switch off if non-repayment - and special case for SHS+ with smart PAYG controller*

*To reduce repayment default rate from customers using payment facilities, the accredited solar suppliers are allowed to include an automatic switch off device to prevent end-users from using their solar PV system in case they do not make their payment on time. The automatic switch-off device also allow to strengthen partnership with Mobile Money Operators so as to reduce costs for payment and late payment recollection.*

*as defined below:*

*2.1.8.1 Eligible smart PAYG controller technologies include:*

- *PAYG keypad controller; or*
- *PAYG remote monitoring controller (GSM or IoT connectivity);*

*2.1.8.2 Performance required for smart PAYG controller are:*

- *Integration in a web-based PAYG software platform to track customers payment in cash or through Mobile Money Operators;*
- *Automatic controller switch-off when customer is late for payment or in case of system misuse by the end-user;*
- *Controller reactivation either with end-user entering code through the keypad or with remote access using dataconnectivity;*
- *Override option to permanently switch-on when payment is fully completed ;*

*2.1.8.3 Permanent smart PAYG controller label by the manufacturer includes the following information:*

- *Brand and Model;*

*2.1.8.4 Documentation for smart PAYG controller use confirms:*

- *Factory quality standard compliance: ISO 9001:2008; or*
- *Performance testing from an independent laboratory; or*
- *Remote smart communication enabled to allow live performance monitoring;*

**Quality Charter section reference: 3.1.1**

**Replace:**

*“● Solar Home Systems (SHSs) power at least 4 appliances (including 2 LED lights) at a rated voltage of 12 VDC and with a total rated peak between 20Wp and 250Wp;”*

**with:**

*● Solar Home Systems (SHSs) and Innovative Solar Home Systems (SHS+) have a total rated peak power between 20Wp and 300Wp and power appliances at a rated voltage of 12 VDC, with additional direct current output options available for mobile phone charging (and a 230VAC output for SHS+ with built-in inverters only) ;*

**And replace:**

*(g) Solar panel<sup>14</sup> and charge controller ensures daily generation of at least 150%<sup>15</sup> of the daily Rated Energy Output, under 5 full solar equivalent hours, and taking into consideration system losses and component performance degradation overtime.*

**With:**

*(g) Solar panel<sup>14</sup> and charge controller ensures daily generation of at least 200%<sup>15</sup> of the daily Rated Energy Output, under 5 full solar equivalent hours, and taking into consideration system losses and component performance degradation overtime.*

**Quality Charter section reference: 4**

**Replace with:**

*“4 Customer Service Standards for Solar Lighting Kits (SLPs & SKs), and Solar Home Systems (SHSs & SHSs+).*

Accredited solar suppliers offer their customers a range of services that ensure customers’ full satisfaction with their Solar Light Points, Solar Kits, Solar Home System and Innovative Solar Home Systems at all times.

**Quality Charter section reference: 4.1 to 4.3**

**Replace “Solar Home System” with “Solar Home System and Innovative Solar Home System”**

**Replace “SHSs” with “SHSs and SHSs+”**