Joint Crediting Mechanism Approved Methodology KE_AM002

"Installation of Solar PV System"

A. Title of the methodology

Installation of Solar PV System, Version 1.0

B. Terms and definitions

Terms	Definitions
Solar photovoltaic (PV) system	An electricity generation system which converts sunlight into electricity by the use of photovoltaic (PV) modules. The system also includes ancillary equipment such as inverters required to change the electrical current from direct current (DC) to alternating current (AC).

C. Summary of the methodology

Items	Summary
GHG emission reduction measures	Displacement of grid electricity and/or captive electricity using fossil fuel as a power source by installation and operation of the solar PV system(s).
Calculation of reference emissions	The reference emissions are calculated on the basis of the AC output of the solar PV system(s) multiplied by the conservative emission factor.
Calculation of project emissions	The project emissions are the emissions from the solar PV system(s), which are assumed to be zero.
Monitoring parameters	The quantity of the electricity generated by the project solar PV system(s).

D. Eligibility criteria

This methodology is applicable to projects that satisfy all of the following criteria.

Criterion 1	The project installs solar PV system(s).

Criterion 2	The PV modules have obtained a certification of design qualifications (IEC 61215, IEC 61646 or IEC 62108) and safety qualification (IEC 61730-1 and IEC 61730-2).
Criterion 3	The equipment to monitor the output power of the solar PV system(s) and irradiance is installed at the project site.

E. Emission Sources and GHG types

Reference emissions	
Emission sources	GHG types
Consumption of grid and/or captive electricity	CO_2
Project emissions	
Emission sources	GHG types
Generation of electricity from solar PV system(s)	N/A

F. Establishment and calculation of reference emissions

F.1. Establishment of reference emissions

In order to identify the reference emission factor simplistically and secure net emission reductions, this methodology applies the lowest emission factor of diesel power generation. The most efficient diesel generator in the world has a generation efficiency close to 49%. A power generation efficiency of 49% translates into an emission factor of 0.533 tCO_2/MWh. This value is lower than the lowest standardized grid emission factor in 2014, which is 0.5793 tCO_2/MWh as the build margin calculated at that time addressed in the report published by the National Environment Management Authority of Kenya (NEMA 2014). This will ensure net emission reductions.

F.2. Calculation of reference emissions

$$RE_p = \sum_i EG_{i,p} \times EF_{RE}$$

RE_p : Reference emissions during period *p* [tCO_2/p]

$EG_{i,p}$: Quantity of electricity generated by project solar PV system *i* during period *p* [MWh/p]

EF_{RE} : Reference CO_2 emission factor [tCO_2/MWh]

G. Calculation of project emissions

Project emissions are not assumed in the methodology as electricity consumption by any PV system is negligible.

$PE_p = 0$

PE_p : Project emissions during period *p* [tCO_2/p]

H. Calculation of emissions reductions

$$ER_p = RE_p - PE_p$$
$$= RE_p$$

ER_p : Emission reductions during period *p* [tCO_2/p]
RE_p : Reference emissions during period *p* [tCO_2/p]
PE_p : Project emissions during period *p* [tCO_2/p]

I. Data and parameters fixed *ex ante*

The source of each data and parameter fixed *ex ante* is listed as below.

Parameter	Description of data	Source
EF_{RE}	The reference CO_2 emission factor The default value for EF_{RE} is set to be 0.533 (tCO_2/MWh). *The efficiency of the most efficient diesel engine is close to but below 49%.	Additional information. The default emission factor is derived from the result of the study on the Kenyan grid emission factors and the survey on the new high-efficient engines using diesel fuel as the power source. The default value is revised if deemed necessary by the JC.

History of the document

Version	Date	Contents revised
01.0	23 March 2017	JC3, Annex 4 Initial approval.