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## Component methodology proposal: Solar PV - IoT

### Submission details

**Component Methodology Code:** DM(M)-065

**Version:** #0

**Submitted at:** Not submitted yet

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### Description

This component methodology provides the monitoring requirements and emission reduction calculations for applicable project activities. This methodology is applicable to project activities employing solar PV technologies to generate renewable energy.

The emission reductions are calculated from the amount of renewable electricity generated by the solar PV project activity. The following information will be required by this methodology:

- Monitoring plan
  - Description of implementation
  - Deviations
- Data management processes and procedures
- Quality control processes

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## Categorisation

Category: Emission reduction

Sectoral scopes:

- Energy industries**
- Energy distribution
- Energy demand
- Manufacturing industries
- Chemical industries
- Construction
- Transport
- Mining/mineral production
- Metal production
- Fugitive emissions from fuels
- Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride
- Solvent use
- Waste handling and disposal
- Afforestation and reforestation
- Agriculture
- Other

## Motivation

To create the monitoring component methodology for solar PV project activities. The system currently does not have a similar methodology.

## Explanation of the compatibilities and possible combinations with other component methods

compatible with CM for PV projects

## Note on required questions

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Please be aware that \* indicates responding to these questions is required.

# Part 1: Project Form

# 1. Monitoring Plan

## 1.2. \* Methods for data measurement and management

Provide details on the methods for measuring, recording, storing, aggregating, collating and reporting data


## 1.3. \* Calibration procedures

Provide all relevant information for the calibration of monitoring equipment including the frequency required


## 1.4. \* Provide the organisational structure

Describe the organisational structure including the roles and responsibilities of personnel involved in the project activity monitoring.


## 1.5. \* Quality control procedures

Provide a description of the internal quality control procedures and oversight policies


## 1.6. \* Procedures for handling non-conformance with the validated monitoring plan

Provide details on how any non-conformances with the validated monitoring plan will be handled


## **Part 2: Data capture input fields**



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## Parameters

<b>MonitoringPeriodStart</b>	
Symbol	MPStart
Data Unit	s
Description	Required parameter: Start date of monitoring period
Type of parameter	InputParameter
Source of data	Manual data entry
Choice of data or measurement methods and procedures	Manual
Quality control procedures	-
Purpose of data	to store the start of monitoring period
Additional comment	-



<b>MonitoringPeriodEnd</b>	
Symbol	MPEnd
Data Unit	s
Description	Required parameter: End date of monitoring period
Type of parameter	InputParameter
Source of data	Manual data entry
Choice of data or measurement methods and procedures	Manual
Quality control procedures	-
Purpose of data	to store the end of monitoring period
Additional comment	-

<b>ElectricityGenerated</b>	
Symbol	ElecGen
Data Unit	kWh
Description	Electricity generated by project and displacing grid electricity
Type of parameter	InputParameter
Source of data	IoT API
Choice of data or measurement methods and procedures	IoT device
Quality control procedures	Calibration according to manufacturer's specifications
Purpose of data	Calculation of baseline emissions
Additional comment	

<b>EmissionsReduction</b>	
Symbol	ER
Data Unit	tCO2e
Description	Emissions reduction per half-hour
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Emission reduction calculations
Additional comment	

<b>GridEmissionFactor</b>	
Symbol	EFGGrid
Data Unit	tCO2/MWh
Description	Electricity generated by project and displacing grid electricity
Type of parameter	Constant
Source of data	Manual data entry
Choice of data or measurement methods and procedures	Published reports
Quality control procedures	n/a
Purpose of data	Calculating baseline emissions
Additional comment	

<b>ProjectEmissions</b>	
Symbol	PE
Data Unit	tCO2e
Description	Project emissions for month
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Calculation of emission reductions
Additional comment	

<b>ProjectEmissionFactor</b>	
Symbol	PEF
Data Unit	tCO2/MWh
Description	EF for project elec generation
Type of parameter	Constant
Source of data	Calculated
Choice of data or measurement methods and procedures	n/a
Quality control procedures	n/a
Purpose of data	Calculation of project emissions
Additional comment	

<b>GridElectricity</b>	
Symbol	ElecConsPG
Data Unit	kWh
Description	Calculated grid electricity used during project
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Calculation of project emissions
Additional comment	

<b>BaselineEmissions</b>	
Symbol	BE
Data Unit	tCO <sub>2</sub> e
Description	Emissions from the baseline
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Calculation of emission reductions
Additional comment	

<b>CalibrationInterval</b>	
Symbol	CalInt
Data Unit	
Description	The calibration interval for specified parameter
Type of parameter	InputParameter
Source of data	Manual data entry
Choice of data or measurement methods and procedures	n/a
Quality control procedures	n/a
Purpose of data	Delayed calibration
Additional comment	

<b>CalibrationDates</b>	
Symbol	CalDate
Data Unit	s
Description	Calibration dates for specified parameter
Type of parameter	InputParameter
Source of data	Manual data entry
Choice of data or measurement methods and procedures	n/a
Quality control procedures	n/a
Purpose of data	Delayed calibration
Additional comment	

<b>AdjustedElectricityGen</b>	
Symbol	AdjElecGen
Data Unit	kWh
Description	Adjusted electricity generated by project for delayed calibration
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Calculation of baseline emissions
Additional comment	

<b>CalibrationError</b>	
Symbol	CalErr
Data Unit	%
Description	Calibration error determined during calibration event
Type of parameter	InputParameter
Source of data	Manual data entry
Choice of data or measurement methods and procedures	n/a
Quality control procedures	n/a
Purpose of data	Delayed calibration
Additional comment	

<b>CalibrationTolerance</b>	
Symbol	CalTol
Data Unit	%
Description	Calibration error tolerance determined by quality procedure
Type of parameter	InputParameter
Source of data	Manual data entry
Choice of data or measurement methods and procedures	n/a
Quality control procedures	n/a
Purpose of data	Delayed calibration
Additional comment	

<b>AdjustedElectricityGenForMP</b>	
Symbol	AdjElecGenForMP
Data Unit	kWh
Description	Adjusted electricity generated by project for monitoring period for delayed calibration
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Calculation of baseline emissions
Additional comment	

<b>BaselineEmissionsMP</b>	
Symbol	BEForMP
Data Unit	tCO2e
Description	Emissions from the baseline for monitoring period
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Calculation of emission reductions
Additional comment	

<b>GridElectricityMP</b>	
Symbol	ElecConsPGForMP
Data Unit	kWh
Description	Calculated grid electricity used during for monitoring period
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Calculation of baseline emissions
Additional comment	



<b>ProjectEmissionsMP</b>	
Symbol	PEForMP
Data Unit	tCO2e
Description	Project emissions for monitoring period
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Calculation of emission reductions
Additional comment	

<b>EmissionsReductionMP</b>	
Symbol	ERForMP
Data Unit	tCO2e
Description	Emissions reduction for monitoring period
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	Emission reductions
Additional comment	

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<b>TotalEmissionsReduction</b>	
Symbol	ERTotal
Data Unit	tCO2e
Description	Emissions reduction for whole project
Type of parameter	OutputVariable
Source of data	
Choice of data or measurement methods and procedures	
Quality control procedures	
Purpose of data	total emission reductions
Additional comment	

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## Equations

Name	Equation	Component Methodology
Eqn2	AdjElecGen{hh in HalfHour}; let {(hho,hhv) in ProjectElement, (cp,"ElecGen") in ProjectElement,(ce,cev) in ProjectElement, (ce2,cev2) in ProjectElement: hho in HalfHour && ce in CalibrationEvent && ce2 in CalibrationEvent && num(cev2)-num(cev)=1 && CalDate[cp,ce] != 0 && CalDate[cp,ce] <= num(hhv) && num(hhv) < CalDate[cp,ce2]} AdjElecGen[hho] := ElecGen[hho]	DM(M)-065
Eqn3	ElecConsPG{hh in HalfHour} = ElecConsBL[hh]-AdjElecGen[hh]	DM(M)-065
Eqn4	PE{hh in HalfHour} = ElecConsPG[hh]*EFGrid+AdjElecGen[hh]*PEF	DM(M)-065
Eqn5	ER{hh in HalfHour} = BE[hh]-PE[hh]	DM(M)-065
Eqn6	PEForMP{mp in MonitoringPeriod} = sum{(hho,mv) in ProjectElement: hho in HalfHour && MPStart[mp] <= num(mv) && num(mv) < MPend[mp]} PE[hho]	DM(M)-065
Eqn7	ERTotal = sum{hh in HalfHour} ER[hh]	DM(M)-065
Eqn8	ERForMP{mp in MonitoringPeriod} = sum{(hho,mv) in ProjectElement: hho in HalfHour && MPStart[mp] <= num(mv) && num(mv) < MPend[mp]} ER[hho]	DM(M)-065
Eqn9	BEForMP{mp in MonitoringPeriod} = sum{(hho,mv) in ProjectElement: hho in HalfHour && MPStart[mp] <= num(mv) && num(mv) < MPend[mp]} BE[hho]	DM(M)-065
EqnAdjElecGenForMP	AdjElecGenForMP{mp in MonitoringPeriod} = sum{(hho,hhv) in ProjectElement: hho in HalfHour && MPStart[mp] <= num(hhv) && num(hhv) < MPend[mp]} AdjElecGen[hho]	DM(M)-065

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EqnElecConsPGForMP	ElecConsPGForMP{mp in MonitoringPeriod} = sum{(hho,hhv) in ProjectElement: hho in HalfHour && MPStart[mp] <= num(hhv) && num(hhv) < MPEnd[mp]} ElecConsPG[hho]	DM(M)-065
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## **Part 3: Monitoring and evaluation input fields**

# 1. Monitoring Plan

## 1.2. \* Provide a detailed description of the current monitoring system

Describe the implemented monitoring system including meter details and specifications


## 1.3. \* Provide any monitoring plan deviations

Provide details about any deviations from the registered monitoring plan


## 1.4. \* Provide a description of the procedures and processes for the control and storage of the project activity data

Provide information around how data is control and stored for the project activity


## 1.5. \* Provide information on quality control processes and procedures

Describe the processes and procedures for quality control


# 2. Project design changes

## 2.2. \* Provide any project design changes that occurred during this monitoring period

Provide details on any project design changes that have occurred this monitoring period


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**2.3. \* Summarise the post registration changes that have occurred to date**

Provide a summary of post registration changes that have occurred to date in the current project activity crediting period.
