



Monitoring report form for CDM project activity
(Version 06.0)

Complete this form in accordance with the instructions attached at the end of this form.

MONITORING REPORT

Title of the project activity	Gimcheon PV Power Plant Site 2 CDM Project	
UNFCCC reference number of the project activity	2684	
Version number of the PDD applicable to this monitoring report	5.0	
Version number of this monitoring report	1.0	
Completion date of this monitoring report	24/01/2018	
Monitoring period number	Second monitoring period	
Duration of this monitoring period	11 May 2011 ~ 31 Dec 2011	
Monitoring report number for this monitoring report	1	
Project participants	Samsung Everland Inc.	
Host Party	Republic of Korea	
Sectoral scopes	Sectoral Scope 1 : Energy industries (renewable/non-renewable sources)	
Applied methodologies and standardized baselines	Version 13 of AMS-I.D. "Grid connected renewable electricity generation"	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	4,377	N/A
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	5,099	

SECTION A. Description of project activity

A.1. General description of project activity

► Purpose of the project activity and the measures taken to reduce greenhouse gas emissions

Purpose of the project activity is electricity generation and greenhouse gas emission reduction which can be achieved by generating electricity from solar energy. Furthermore photovoltaic power plant does not cause any natural resource depletion.

► Brief description of the installed technology and equipment

The project activity is electricity generation by converting sunlight into electricity. Total capacity of the project is 9.3MW and project is comprised of 2 types of solar systems. One type is stationary (8.63MW) and the other type is system with trackers (0.67MW).

The components of the plant are supplied by the companies have advanced technology.

- Module : SunPower, S-Energy, Suntech
- Tracker : Poscon, SunPower
- Inverter : Siemense

<Technology description-Module>

Supplier	Suntech			
Capacity	170Wp	175Wp	190Wp	200Wp
Construction Capacity(kWp)	435.2kWp	4855.2kWp	1778.6kWp	2221.8kWp
Efficiency (%)	15.8%	16.2%	14.2%	15.0%
PV Cell Type	Mono	Mono	Poly	Poly
Control type	Stationary	With tracker(672.0kWp) Stationary(4183.2kWp)	Stationary	Stationary
Module error	±3%	±3%	±3%	±3%

A.2. Location of project activity

San 104, Okgye-ri, Eomo-myeon, Gimcheon, Gyeongsangbuk-do, Korea (latitude of 36.14°N and longitude of 128.04°E)

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of Korea	Samsung Everland Inc. (private entity)	No

A.4. Reference to applied methodologies and standardized baselines

Version 13 of AMS-I.D. "Grid connected renewable electricity generation"

A.5. Crediting period type and duration

Fixed crediting period : 28/09/2009 ~ 27/09/2019

SECTION B. Implementation of project activity**B.1. Description of implemented project activity**

Construction was started on 10/07/2008 and completed on 30/01/2009. The plant has been operating well since 29/09/2008. Any event or situation did not occur during the monitoring period, which may impact the applicability of the methodology.

B.2. Post-registration changes**B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies or standardized baselines**

Not applicable

B.2.2. Corrections

Not applicable

B.2.3. Changes to the start date of the crediting period

Not applicable

B.2.4. Inclusion of monitoring plan

Not applicable

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

To monitor E_{Gy}, measurement of electricity supplied to the Grid and electricity supplied from the Grid need to monitor. Therefore, additional meter to measure electricity from the Grid is required to be installed and it measures general electricity consumption for industrial use and general use within the project boundary which is not directly related to power generation by this project activity.

Date	Event	Details
June 2011 (During the First monitoring verification)	Validation of the revised monitoring plan (validator : KFQ)	Meter to measure electricity from the Grid is added as requested by Korea Electric Power Corporation (KEPCO)

B.2.6. Changes to project design

Not applicable

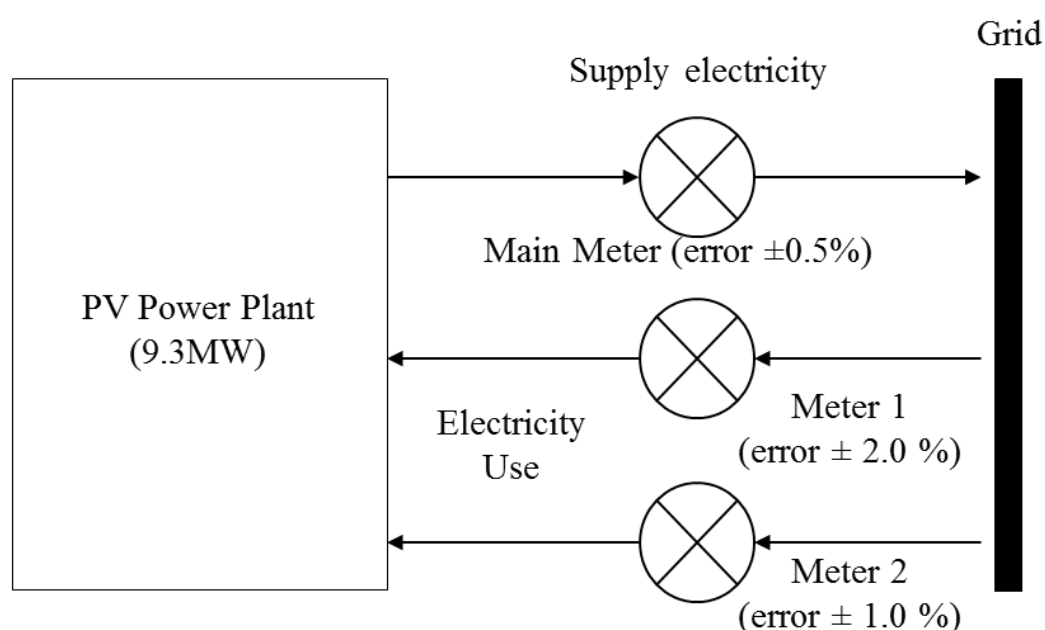
SECTION C. Description of monitoring system

► Data collection procedure

The electricity supplied to the grid by the project have to be monitored through the main meter. The data is measured hourly and automatically transmitted to Korea Power Exchange. The operator can check the data online. The electricity generation is reported to the general manager of the organization who is in charge of operation everyday and reported to stockholders of Gimcheon Enervix once a month.

The amount of electricity used at the project site is monitored through the meter and the operator of the plant can check the data through a monthly receipt.

Net electricity generated by the project activity (EGy) is calculated by subtracting the amount of electricity used from total electricity generation.

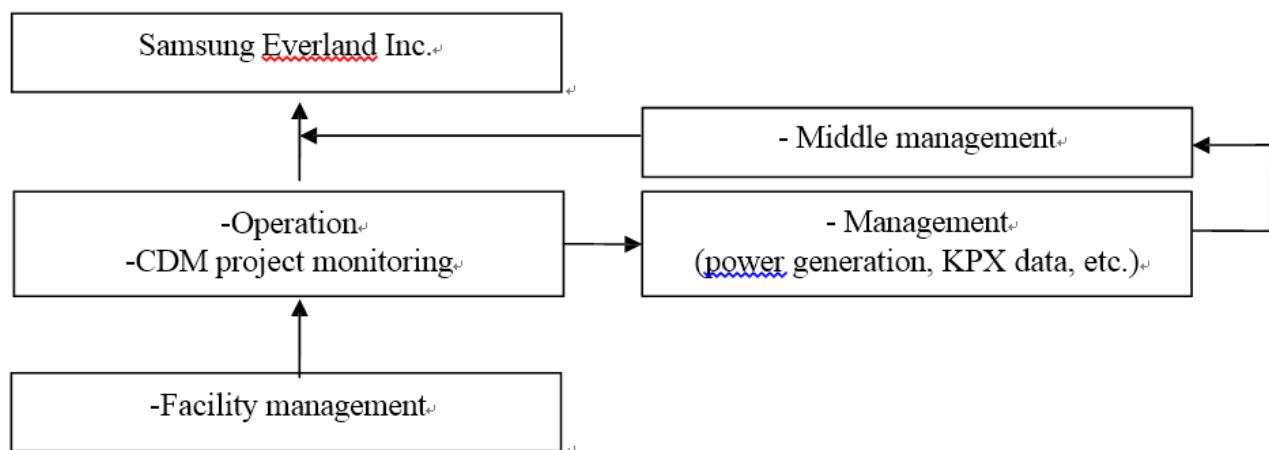


Meter	Monitoring data	Details
Meter 1	The amount of electricity used at the site	Measures electricity for industrial use
Meter 2		Measures electricity for general use
Main meter	The generated electricity	Transmitted to Korea Power Exchange

The amount use of electricity is measured by meter 1 and meter 2. Meter 1 measures the amount of electricity which is for industrial use such as inverter operation. Meter 2 which is added after CDM registration measures the amount of general electricity use which is supplied to street lights, security system, etc.

Measuring instruments are calibrated every 2 years. QA/QC guidance and procedure follow Measures Act and Rules on Electricity Market Management.

► Organizational structure for the monitoring



Sales Support Team is in charge of all tasks related to this project (operation, management, monitoring etc.).

► Responsible department and person for the monitoring

Total management : Samsung Everland Inc.

Middle management : Sales Support Team

Plant operation and CDM project monitoring : Sales Support Team

Management (power generation, KPX data etc.) : Sales Support Team

Facility management : Sales Support Team

► Emergency procedure

When emergency situation occurs, it will be handled according to the operation manual. The situation will be reported to the general manager of Sales Support Team and the general manager will report the situation to the vice president

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	EF ₂₀₀₈
Unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the "Tool to calculate the emission factor for an electricity system"
Source of data	Calculated from Statistics of Electric Power in Korea (2006,2007,2008) / KEPCO
Value(s) applied	0.6152
Choice of data or measurement methods and procedures	The value was calculated according to "Tool to calculate the emission factor for an electricity system"
Purpose of data/parameter	The data is used for baseline emission calculation
Additional comments	The value is ex-ante and used for the crediting period.

D.2. Data and parameters monitored

Data/Parameter	EG _y
Unit	MWh
Description	Net electricity generated by the project activity
Measured/calculated/default	Measured and calculated

Source of data	Actual measurement																														
Value(s) of monitored parameter	7,115.959																														
Monitoring equipment	<p>Electricity meters' information:</p> <ul style="list-style-type: none"> · Main meter (measures total electricity generation) <table border="1"> <thead> <tr> <th>Serial No.</th><th>Accuracy</th><th>Calibration done on</th><th>Calibration due on</th><th>Calibration frequency</th></tr> </thead> <tbody> <tr> <td>95246745</td><td>0.5</td><td>11/05/2011</td><td>10/05/2013</td><td>2 years</td></tr> </tbody> </table> · Meter 1 (measures electricity for industrial use) <table border="1"> <thead> <tr> <th>Serial No.</th><th>Accuracy</th><th>Calibration done on</th><th>Calibration due on</th><th>Calibration frequency</th></tr> </thead> <tbody> <tr> <td>09350007462</td><td>1.0</td><td>23/09/2009</td><td>22/09/2011</td><td>2 years</td></tr> </tbody> </table> · Meter 2 (measures electricity for general use) <table border="1"> <thead> <tr> <th>Serial No.</th><th>Accuracy</th><th>Calibration done on</th><th>Calibration due on</th><th>Calibration frequency</th></tr> </thead> <tbody> <tr> <td>05353627020</td><td>1.0</td><td>23/09/2009</td><td>22/09/2011</td><td>2 years</td></tr> </tbody> </table> 	Serial No.	Accuracy	Calibration done on	Calibration due on	Calibration frequency	95246745	0.5	11/05/2011	10/05/2013	2 years	Serial No.	Accuracy	Calibration done on	Calibration due on	Calibration frequency	09350007462	1.0	23/09/2009	22/09/2011	2 years	Serial No.	Accuracy	Calibration done on	Calibration due on	Calibration frequency	05353627020	1.0	23/09/2009	22/09/2011	2 years
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Measuring/reading/recording frequency	The data is measured hourly and recorded monthly																														
Calculation method (if applicable)	EG _y is calculated by subtracting the amount of electricity used from total electricity generation																														
QA/QC procedures	QA/QC guidance and procedure follow Measures Act and Rules on Electricity Market Management																														
Purpose of data/parameter	The data is used for emission reduction calculation																														
Additional comments																															

D.3. Implementation of sampling plan

Not applicable

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

The total electricity generation 7,278.765 MWh (11/05/2011 ~ 31/12/2011) is measured the main meter which is calibrated on 11/05/2011.

The used electricity for general is 46,476 kWh, for industrial is 116,330 kWh, making a total of 162,806 kWh.

As the baseline emissions were calculated in a conservative manner which was mentioned in paragraph 4 of "Guidelines for assessing compliance with the calibration frequency requirements", although this monitoring period start from 11/05/2011, the use of electricity is to be calculated from 1st of May 2011 to 31th of Dec 2011.

Therefore, the net generated electricity 7,115.959 MWh/yr is used for conservative baseline emissions calculation.

The baseline emissions during this monitoring period are as follow:

$$\begin{aligned}
 BE_{(11/05/2011-31/12/2011)} &= EG_{(11/05/2011-31/12/2011)} \times EF \\
 &= (7,278.765 - 116.330 - 46.476) \text{ MWh} \times 0.6152 \text{ tCO}_2/\text{MWh} \\
 &= 7,115.959 \text{ MWh} \times 0.6152 \text{ tCO}_2/\text{MWh} \\
 &= 4,377.738 \text{ tCO}_2
 \end{aligned}$$

E.2. Calculation of project emissions or actual net removals

The project emissions of this project activity are zero because this project activity is photovoltaic power generation which does not cause greenhouse gas emission.

E.3. Calculation of leakage emissions

Leakage due to the project is not occurred.

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	4,377.738	0	0	4,377.738		4,377

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO ₂ e)	Amount estimated ex ante (t CO ₂ e)
4,377	5,099

E.6. Remarks on increase in achieved emission reductions

The actual emission reduction achieved during the current monitoring period is about 14% lower than estimated value in the registered PDD. According to the baseline methodology ex-ante emission reductions were calculated by using expected electricity generation. Expected electricity generation was based on statistic of past weather. However, there were more cloudy or rainy days during the monitoring period. It caused the actual emission reductions lower than estimated value.

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		