



**Monitoring report form  
(Version 05.1)**

*Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.*

**MONITORING REPORT**

<b>Title of the project activity</b>	Solar Thermal Power Plant by Godawari Green Energy Limited	
<b>UNFCCC reference number of the project activity</b>	7379	
<b>Version number of the monitoring report</b>	02	
<b>Completion date of the monitoring report</b>	28/08/2015	
<b>Monitoring period number and duration of this monitoring period</b>	First Monitoring period and duration of the 19/06/2013 – 18/06/2015	
<b>Project participant(s)</b>	Godawari Green Energy Limited	
<b>Host Party</b>	India	
<b>Sectoral scope(s)</b>	Sectoral Scope 1: Energy industries (renewable - / non-renewable sources)	
<b>Selected methodology(ies)</b>	ACM0002 ver. 12 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources	
<b>Selected standardized baseline(s)</b>	NA	
<b>Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD</b>	226,320 tCO <sub>2e</sub>	
<b>Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period</b>	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	NA	146,443 tCO <sub>2e</sub>

**SECTION A. Description of project activity****A.1. Purpose and general description of project activity**

&gt;&gt;

Godawari Green Energy Limited has implemented a new 50 MW large-scale grid connected solar thermal power project ("Project activity") in Jaisalmer district, Rajasthan, India. Project activity comprises of state-of-the-art, environment friendly, solar thermal power generation using parabolic trough technology. Project activity comes under the purview of large-scale, solar thermal power technology based project to be implemented in India.

Electricity generated from the project activity will be sent to Combined Regional grid i.e. Northern, Eastern, Western, and North-Eastern grids(NEWNE) of India. As a result of commissioning, the gross electricity generation in the project activity is 130,263 MWh/year and the auxiliary electricity consumption in the project activity is 11,397 MWh/year. Accordingly this project activity is expected to supply 118,866 MWh net electricity to the grid per year and abates 1,131,600 tonnes of Carbon Dioxide emissions, in the project boundary, during the crediting period.

The present monitoring period is from 19/06/2013 to 18/06/2015 through which emission reduction claimed is 146,443 tCO<sub>2e</sub>

Start date of the project activity is 20/08/2011, i.e. date of the equipment purchase and EPC Contract date is 20/08/2011.

**A.2. Location of project activity**

&gt;&gt;

Host Party: India

State: Rajasthan

District: Jaisalmer

Nokah Village, Pokaran Tehsil

GPS Coordinates: Longitude- 72° 14' 9.2" E

Latitude- 27° 36' 13" N



Figure 1: Map of India(Source- Google Maps)

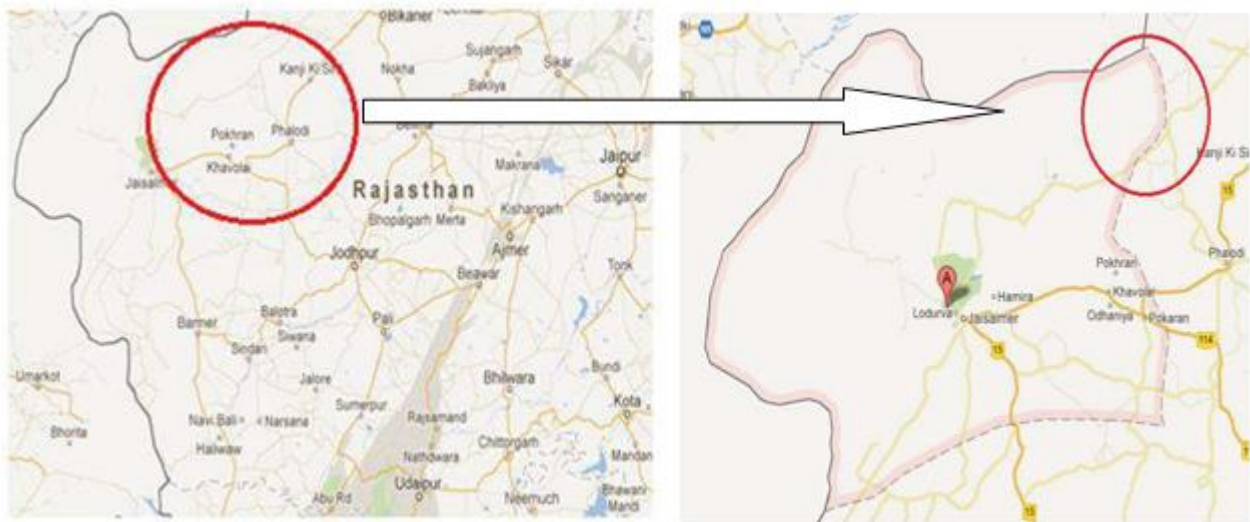


Figure 2: Rajasthan and Project Site (Source: Google Maps)

**A.3. Parties and project participant(s)**

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
India(Host Party)	Godawari Green Energy Limited (Private entity)	No

**A.4. Reference of applied methodology and standardized baseline**

&gt;&gt;

Methodology: ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.3.0, EB 66)

The following tools have been used for the project activity under consideration –

- Tool to calculate emission factor for an electricity system Reference: Version 02.2.1/EB – 63, Annex 19
- Demonstration and assessment of additionality Reference: Version 06, EB 65, Annex 21

**A.5. Crediting period of project activity**

&gt;&gt;

Fixed Crediting Period: 10 years

Start date of crediting period: 19/06/2013

Present Monitoring Period: 19/06/2013 to 18/06/2015 (both dates inclusive)

**A.6. Contact information of responsible persons/entities**

&gt;&gt;

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

&gt;&gt;

Project activity is grid-connected large-scale 50 MW solar thermal power generation facility using environmentally safe and sound technology.

In the pre project scenario, the equivalent amount of electricity is being generated by the power plants connected with the NEWNE grid. These plants are dominated by the use of fossil fuels to generate electricity.

Electricity generation is through solar thermal power generation technology. Technology for implementation of project activity is sourced from reputed international suppliers leading to the transfer of technology. The list of major equipment and manufacturer/technology provider is given

in Table 1. The whole plant is executed under EPC contract by M/s Lauren Engineers & Constructors India Pvt Ltd. and operated by Godawari Green Energy Limited.

**Table 1: Major Equipment list of Manufacturer/Technology Provider**

Equipment	Manufacturer's / Technology provider
Steam turbo generator (STG)	Siemens, Sweden
Heat exchanger	Alborg CSP, Denmark
Solar collector loops	Design by SBP, Germany
Cooling tower	Paharpur cooling tower, India
Boiler feed pump	Sulzer India
Heat Transfer Fluid (HTF) vessel	Ravi Industries, India
HTF pump	Sulzer India
Deaerator	Ravi Industries, India
Reflectors	Flagbag, Germany
Receiver Tube	Schott Glass, Germany

## **B.2. Post-registration changes**

### **B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline**

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Not Applicable

### **B.2.2. Corrections**

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Not Applicable

### **B.2.3. Changes to start date of crediting period**

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Earlier crediting period was from 09/05/2013 - 08/05/2023 and now it has been changed to new crediting period 19/06/2013 to 18/06/2023.

### **B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration**

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Not Applicable

### **B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline**

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Not Applicable

### **B.2.6. Changes to project design of registered project activity**

>>

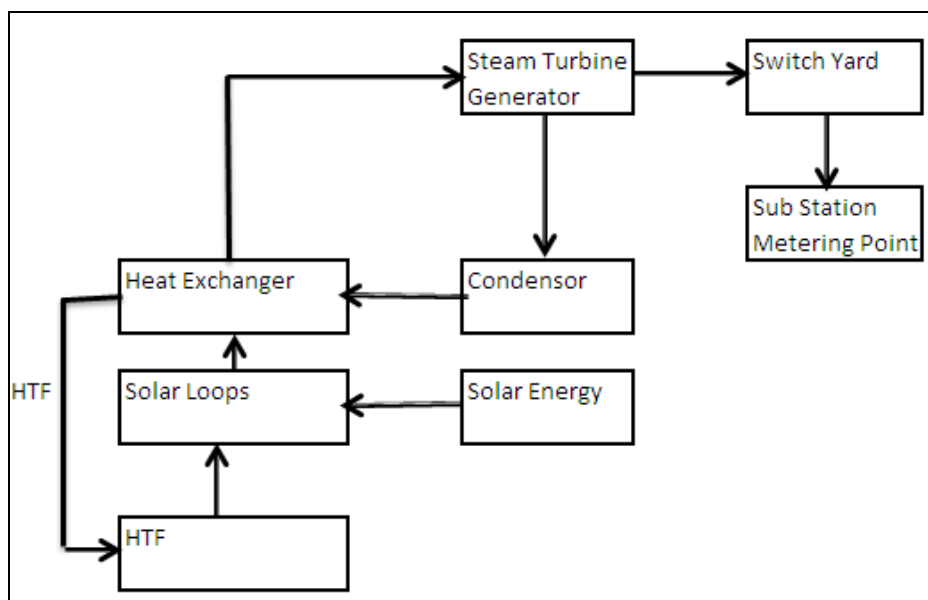
Not Applicable

**B.2.7. Types of changes specific to afforestation or reforestation project activity**

>>  
Not Applicable

**SECTION C. Description of monitoring system**

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In Accordance to ACM0002 ver. 12 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources The project activity is generating electricity from Solar energy for which GHG emission is nil. The generated electricity is supplied to grid. Thus the power generated in the project activity is actually displacing the electricity generated from the fossil fuels in the NEWNE grid. In case the project activity would not have been there, the same amount of electricity would have been generated from the power plants connected to the grid of which majority of the power plants are based on fossil fuels.

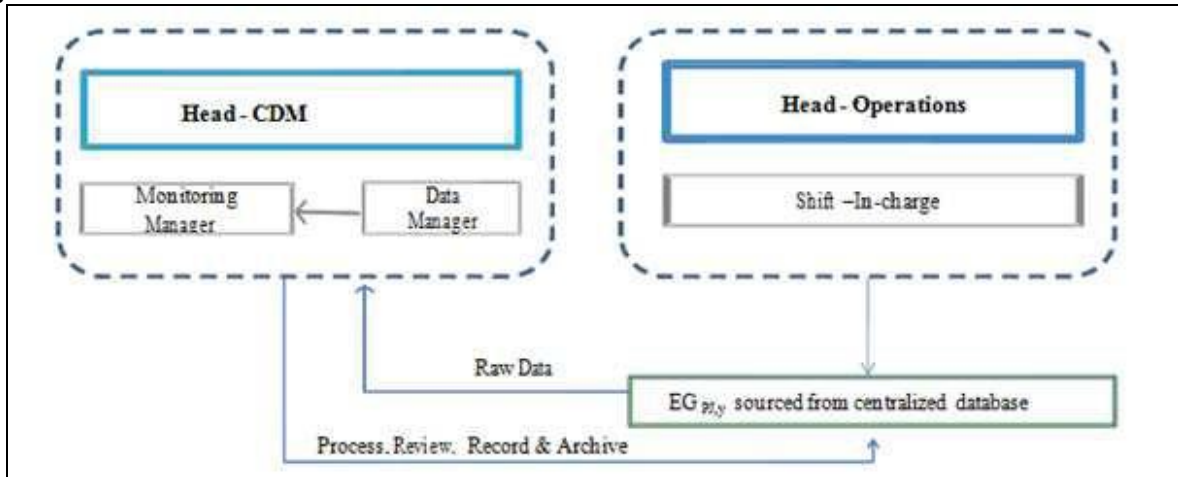


**Figure 3: Schematic Diagram of the Project**

**Roles and Responsibility**

The project proponent has operational & management structure in order to monitor the emission reduction and processes in place. Monitoring plan includes roles and responsibilities for individuals, selection, metering and calibration of monitoring equipment, metering of  $EG_{facility,Y}$ , and other relevant aspects. This includes systems and protocols implemented by project participant in order to ensure reliability, transparency and consistency while carrying-out various critical activities such as metering, data management and computation of emission reductions achieved by the project activity.

**Organizational Structure**



**Figure 4: Organizational Structure**

Designation	Responsibility
Head - CDM	<ul style="list-style-type: none"> <li>a. Complete responsibility of CDM implementation of project activity including preparation of PDD, validation, verification and associated action thereto as indicated in PDD.</li> <li>b. Formulate monitoring compliance protocols &amp; human resources training guidelines for O&amp;M, &amp; CDM teams to comply with Monitoring Plan requirements.</li> <li>c. Ensure adequate training is offered for O&amp;M and CDM teams to comply with the requirements of project activity.</li> <li>d. Establish systems for data management and approve data submitted by CDM operational team.</li> </ul>
Monitoring Manager – CDM	<ul style="list-style-type: none"> <li>a. Implementation of compliance guidelines for O&amp;M &amp; CDM teams to comply with PDD including Monitoring Plan.</li> <li>b. Coordinating with O&amp;M teams for collection of data.</li> <li>c. Ensure that O&amp;M team and comply with monitoring of data, including calibration and archiving of date are carried-out as per the frequency indicated in data management section.</li> <li>d. Carry-out QA/QC checks on data collected by data managers, and conduct the consistency checks.</li> <li>e. Computation of Emission Reductions based on the data</li> <li>f. Conduct training programs for internal stakeholders.</li> </ul>

Designation	Responsibility
Data Managers - CDM	a. Collection of data from O&M group. b. Carrying-out consistency checks on parameters and formats. c. Prepare the data for calculations, d. Storage of data including calibration and maintain data and retrieval of data.
Head – Operation	a. Monitor, measure, calibrate and store electricity generation data and other related data

## SECTION D. Data and parameters

### D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/parameter:	EF <sub>Grid, CM,y</sub>
Unit	tCO <sub>2</sub> e/MWh
Description	Combined margin CO <sub>2</sub> emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO <sub>2</sub> /MWh)
Source of data	Central Electricity Authority (CEA) database
Value(s) applied)	0.952
Choice of data or measurement methods and procedures	Registered PDD
Purpose of data	Baseline emission calculations
Additional comments	The baselines emission factor was determined ex ante and will be used throughout the first crediting period.

### D.2. Data and parameters monitored

Data/parameter:	EG <sub>TG</sub>
Unit	MWh
Description	Quantity of net electricity generated
Measured/calculated/default	Data Type: Measured
Source of data	Monthly from Energy Meter
Value(s) of monitored parameter	159,291.1
Monitoring equipment	Monitoring equipment: Energy Meter is used for continuous monitoring Accuracy class : 0.2S
Measuring/reading/recording frequency:	The electricity is continuously measured and monthly recorded.
Calculation method (if applicable):	Not Applicable
QA/QC procedures:	The data is calculated. The data is archived in Electronic/paper form for a period a credit + 2 years.



Purpose of data:	Baseline emission calculation
Additional comments:	Not Applicable

<b>Data/parameter:</b>	EG <sub>AUX</sub>
Unit	MWh
Description	Total electricity consumed by CSP Plant together
Measured/calculated/default	Data Type: Measured
Source of data	Monthly from Energy Meter
Value(s) of monitored parameter	5,463.5
Monitoring equipment	Monitoring equipment: Energy Meter is used for continuous monitoring Accuracy class : 0.2S
Measuring/reading/recording frequency:	The electricity is continuously measured and monthly recorded.
Calculation method (if applicable):	Not Applicable
QA/QC procedures:	The data is calculated. The data is archived in Electronic/paper form for a period a credit + 2 years.
Purpose of data:	Baseline emission calculation
Additional comments:	Not Applicable

<b>Data/parameter:</b>	EG <sub>facility,y</sub>
Unit	MWh
Description	Quantity of Total Electricity exported to Grid
Measured/calculated/default	Data Type: Measured
Source of data	Monthly from Energy Meter
Value(s) of monitored parameter	153,827.6
Monitoring equipment	Monitoring equipment: Energy Meter is used for continuous monitoring Accuracy class : 0.2S
Measuring/reading/recording frequency:	The electricity is continuously measured and monthly recorded.
Calculation method (if applicable):	Not Applicable
QA/QC procedures:	The data is calculated. The data is archived in Electronic/paper form for a period a credit + 2 years.
Purpose of data:	Baseline emission calculation
Additional comments:	Not Applicable

### D.3. Implementation of sampling plan

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Not Applicable

**SECTION E. Calculation of emission reductions or GHG removals by sinks**

**E.1. Calculation of baseline emissions or baseline net GHG removals by sinks**

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Baseline for the project activity is power generated from renewable energy source multiplied by the grid emission factor of NEWNE grid calculated in transparent and conservative manner.

$$BE_y = EGBL_{,y} \times EF_{Grid, CM, y}$$

The ex-ante calculation of baseline emissions in one crediting year of project activity:

$$EG_{facility,y} = 153,827 \text{ MWh}$$

$$EF_{Grid, CM,y} = 0.952 \text{ tCO}_2\text{e/MWh}$$

$$BE_y = 153827\text{MWh} * 0.952 \text{ tCO}_2\text{e}$$

$$= 146,443 \text{ tCO}_2\text{e}$$

Where

$BE_y$  is Baseline Emissions (tCO<sub>2</sub>e)

$EF_{Grid, CM, y}$  is the is Combined margin CO<sub>2</sub> emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO<sub>2</sub>/MWh)

**E.2. Calculation of project emissions or actual net GHG removals by sinks**

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Project Emissions: 0 tCO<sub>2</sub>e

**E.3. Calculation of leakage**

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Leakage: 0 tCO<sub>2</sub>e

**E.4. Summary of calculation of emission reductions or net GHG removals by sinks**

Item	Baseline emissions or baseline net GHG removals by sinks (t CO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (t CO <sub>2</sub> e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
<b>Total</b>	146,443 tCO <sub>2</sub> e	0	0	NA	146,443 tCO <sub>2</sub> e	146,443 tCO <sub>2</sub> e

**E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD**

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	226,320 tCO <sub>2</sub> e	146,443 tCO <sub>2</sub> e

**E.6. Remarks on difference from estimated value in registered PDD**

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In the present Monitoring Period 19/06/2013 to 18/06/2015, the actual emissions is 146,443 tCO<sub>2</sub>e. This amount is lower than the expected emission reduction as calculated in the PDD. This is mainly due to the fact that the amount of heat generated from the project site during this monitoring period was lower than the average heat generation.

## Appendix 1. Contact information of project participants and responsible persons/entities

<b>Project participant and/or responsible person/ entity</b>	<input type="checkbox"/> Project participant <input checked="" type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
<b>Organization name</b>	PE Sustainability Solutions Pvt. Ltd.
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<b>Contact person</b>	Mr Ritesh Agrawal
<b>Title</b>	Senior Consultant
<b>Salutation</b>	Mr
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<b>Middle name</b>	-
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<b>Personal e-mail</b>	<a href="mailto:ritesh.agrawal@thinkstep.com">ritesh.agrawal@thinkstep.com</a>

<b>Project participant and/or responsible person/ entity</b>	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
<b>Organization name</b>	M/s Godawari Green Energy Limited
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<b>State/region</b>	Chhattisgarh
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<b>Telephone</b>	91-771-4082749
<b>Fax</b>	91-771-4057601
<b>E-mail</b>	<a href="mailto:lkp46ster@gmail.com">lkp46ster@gmail.com</a>
<b>Website</b>	<a href="http://www.hiragroupindia.com">www.hiragroupindia.com</a>

<b>Contact person</b>	Mr Lakshman Prasad
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<b>Last name</b>	Prasad
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### Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> <li>• Include provisions related to delayed submission of a monitoring plan;</li> <li>• Provisions related to the Host Party;</li> <li>• Remove reference to programme of activities;</li> <li>• Overall editorial improvement.</li> </ul>
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> <li>• Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0));</li> <li>• Include provisions related to standardized baselines;</li> <li>• Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1;</li> <li>• Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>;</li> <li>• Editorial improvement.</li> </ul>
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 (EB70, 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	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		