	CDM small-scale project activities bundling form (Version 05.0)	
BASIC INFORMATION		
Title of the bundle	Solar and Wind Project by Agrawal Renewable Energy Pvt. Ltd.	
Number of project activities in the bundle	02	
Titles of the project activities in the bundle	Solar and Wind Project by Agrawal Renewable Energy Pvt. Ltd.	
Host Party	INDIA	
Bundle type (Tick relevant boxes)	<input type="checkbox"/> All project activities in the bundle apply the same set of methodologies and technology/measure: <input checked="" type="checkbox"/> A single PDD covering all project activities in the bundle has been prepared <input type="checkbox"/> Separate PDDs, each of which corresponding to each project activity in the bundle, have been prepared <input type="checkbox"/> Different project activities in the bundle apply different set of methodologies and/or technologies/measures	
Applied methodologies and standardized baselines	Methodology: AMS-I.D "Grid connected renewable electricity generation" (Version 18.0 ¹) Standardized Baseline: Not Applicable	
Sectoral scopes linked to the applied methodologies	01- Energy industries (renewable/non-renewable sources)	
Estimated amount of annual average GHG emission reductions by the bundle	14,103 tCO ₂ e/ annum	

¹ <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

SECTION A. Description of bundle**A.1. General description of project activities in bundle**

Title of project activity	Small-scale project type (I, II or III)	Applied methodologies (UNFCCC methodology number)	Technologies/measures
Solar and Wind Project by Agrawal Renewable Energy Pvt. Ltd.	Small-scale project type-I	AMS-I.D "Grid connected renewable electricity generation" (Version 18.0 ²)	Solar
			Wind

A.2. Location of project activities in bundle

Title of project activity	Address	Geographic coordinates
Solar and Wind Project by Agrawal Renewable Energy Pvt. Ltd.	Agrawal Renewable Energy Pvt. Ltd., Village: Ringnod, Tehsil: Jaora, District: Ratlam, Madhya Pradesh	23° 43' 51.19" N, 75° 10' 15.20" E 23° 43' 38.74" N, 75° 10' 14.79" E
	Agrawal Solar Power (UP) Private Limited, Village: Karahara Kala, District: Mahoba, Uttar Pradesh	25° 19' 0.58" N, 79° 48' 46.93" E

SECTION B. Application of selected methodologies and standardized baselines**B.1. Summary of ex ante estimates of emission reductions (total in the bundle)**

Year	Baseline emissions (t CO ₂ e)	Project emissions (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions (t CO ₂ e)
Year 1	14,103	0	0	14,103
Year 2	14,103	0	0	14,103
Year 3	14,103	0	0	14,103
Year 4	14,103	0	0	14,103
Year 5	14,103	0	0	14,103
Year 6	14,103	0	0	14,103
Year 7	14,103	0	0	14,103
Total	104,818	0	0	104,818
Total number of crediting years	7			
Annual average over the crediting period	14,103	0	0	14,103

B.2. Establishment of baseline scenario

For the project activities in this bundle project, same baseline is applicable. The description of the baseline established for the project activity is explained below.

As the project activity is the installation of a Greenfield power plant, the baseline scenario is the following as per applied methodology:

The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.

² <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTFQOQFQQH4SBK>

The project activity involved setting up of a solar plant to harness the power of sunlight and wind parks to harness the power of the wind to produce electricity and supply to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the INDIAN electricity grid, which is fed mainly by fossil fuel fired plants.

Hence, the baseline for the project activity is the equivalent amount of power from the INDIAN electricity grid.

The combined margin ($EF_{grid,CM,y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) (having weightage 25%) and build margin (BM) (having weightage 75%). Calculations for this combined margin must be based on data from an official source³ (where available) and made publically available.

The combined margin of the Indian grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
$EF_{grid,CM,y}$	0.9777 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 11.0 Dated April 2016 published by Central Electricity Authority (CEA), Government of India.
$EF_{grid,OM,y}$	0.9941 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3 year (2012-2013, 2013-2014 & 2014-2015) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 11.0, Dated April 2016 published by Central Electricity Authority (CEA), Government of India.
$EF_{grid,BM,y}$	0.9285 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	Baseline CO ₂ Emission Database, Version 11.0, Dated April 2016 published by Central Electricity Authority (CEA), Government of India.

B.3. Monitoring plan

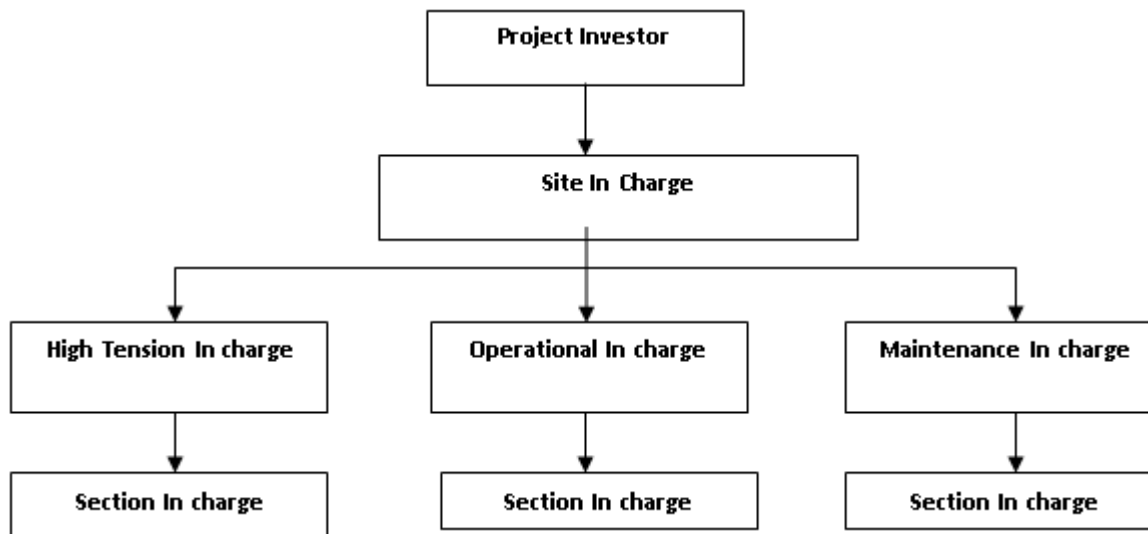
The monitoring plan is developed in accordance with the modalities and procedures for CDM project activities and is proposed for grid-connected wind and solar power project being implemented in Madhya Pradesh and Uttar Pradesh, India. The monitoring plan, which will be implemented by the project participants describes about the monitoring organisation, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

1. For 4.2 MW Wind Power Project

The monitoring plan, which will be implemented by the project participants describes about the monitoring organisation, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

³ http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the project participants. PP proposed the following structure for data monitoring, collection, data archiving and calibration of equipments for this project activity. The team comprises of the following members:



PP has assigned the responsibility of operation and maintenance of WTGs to the respective WTG Supplier and is having a valid O&M Contract. The Plant In-charge and Shift In-Charge would be deployed by WTG Supplier.

Monitoring Requirements

The monitoring plan includes monitoring of energy parameters such as net energy export to the regional grid which is further used for captive purpose. Emission reductions resulted from the project activity will be calculated based on the net energy exported to the grid. Sales records will be used and kept for checking the consistency of the recorded data.

Project participant will calibrate the meter at-least once in 5 year⁴. For the WTGs in project activity, the monthly reading is taken from the meter at substation by state utility and representative of PP. This reading gives the net electricity exported to the grid by all WTGs connected to the substation. The WTGs of other owners are also connected to the substation. Apportioning is not under the control of PP and generation report forms the basis of emission reductions calculations.

Data Measurement

The export and import energy will be measured continuously using above mentioned Main & Check meters. Export & Import readings of Main & Check meters shall be taken on monthly basis by authorized officer of State Discom in the presence of PP or representative of PP. The meter reading will be taken jointly and signed by the representatives of the State Electricity Board and authorized representatives of project investors. Based on the readings, invoices will be raised by project investors. These invoices can be used for cross checking the meter readings taken for the project activity. It is to be noted though PP or PP representative is available during meter reading, the calculations of net electricity supplied to grid is completely under purview of electricity board officer and PP do not have any control on it. Also accuracy class of meters and calibration frequency is under purview of electricity board and PP do not have any control on it. PP got the

⁴ http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf

monthly credit report from where net electricity supplied to grid is obtained and used for emission reduction calculations.

Data collection and archiving

Export & Import readings from main & check meter will be collected under the supervision of the plant in-charge. The net electricity supplied to grid would be calculated based on export & import readings. Export and Import data would be recorded and stored in logs as well as in electronic form on a daily basis. The records are checked periodically by the Plant Manager and discussed thoroughly with the plant supervisor. The period of storage of the monitored data will be 2 years after the end of crediting period or till the last issuance of CERs for the project activity whichever occurs later.

Emergency preparedness

The project activity will not result in any unidentified activity that can result in substantial emissions from the project activity. No need for emergency preparedness in data monitoring is visualized.

In the event that the main meter, which is used to record the net electricity exported by the project, is found to be faulty it will be repaired or replaced and the data from the check meter will be used in its place. In the unlikely event that the check meter fails it will also be repaired or replaced. During this time when both the main meter and check meter are repaired or replaced simultaneously, the net electricity shall be taken from the SCADA. In this regard, it should also be noted that the imported electricity and exported electricity are monitored continuously through SCADA and, hence, the net electricity is taken from the SCADA. Also, the SCADA net electricity value shall be compared with the lower value over the previous twelve months, using the values recorded in the Metered Net Electricity Generation monthly reports, described above and the lower of the two values shall be used. In the event of meter failure, the details will be recorded by the Assistant Engineer / Junior Engineer and summarized in a discrete section of the Emission Reductions quarterly report.

Personnel training

In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the staff (CDM team) will be trained. The plant helpers will be trained in equipment operation, data recording, reports writing, operation and maintenance and emergency procedures in compliance with the monitoring plan.

Apportioning

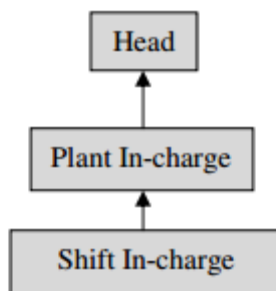
In case of mismatch of date between the start date of the billing cycle and the start date of monitoring period, the data will be apportioned in line to the daily generation values for the said mismatch period.

2. For 5 MW Solar PV Project in Uttar Pradesh State

The monitoring plan, which will be implemented by the project participants describes about the monitoring organisation, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the project participants. PP proposed the following structure for data monitoring, collection, data archiving and calibration of equipments for this project activity. The team comprises of the following members:

Organisational Structure for Monitoring



Responsibilities of Head: Overall functioning and maintenance of the project activity.

Responsibilities of Plant In-charge: Responsibility for Maintains the data records, ensures completeness of data, and reliability of data (calibration of equipments).

Responsibilities of Shift In-charge: Responsibility for day to day data collection and maintains day to day log book for monitored data.

Data Measurement

The export and import energy will be measured continuously using above mentioned Main & Check meters. Export & Import readings of Main & Check meters shall be taken on monthly basis by authorized officer of SEB in the presence of PP or representative of PP. The meter reading will be taken jointly and signed by the representatives of the SEB and PP or representative of PP. Based on the readings, invoices will be raised by PP or representative of PP. These invoices can be used for cross checking the meter readings taken for the respective project activity.

Data collection and archiving

Export & Import readings from main & check meter will be collected under the supervision of the plant in-charge. The net electricity supplied to grid would be calculated based on export & import readings. Export and Import data would be recorded and stored in logs as well as in electronic form on a daily basis. The records are checked periodically by the Plant Manager and discussed thoroughly with the plant supervisor. The period of storage of the monitored data will be 2 years after the end of crediting period or till the last issuance of CERs for the project activity whichever occurs later.

In case the dates of a particular monitoring period do not match with the dates of the billing cycle, the net electricity exported to the grid would be calculated from:

- Apportioning the net electricity exported to grid, as recorded in the consolidated Share Certificate / JMR Report / Credit Notes certified by the respective state discom, based on the number of days in the monitoring period and the number of days for which Share Certificate / JMR Report / Credit Notes was prepared.

The calculated value after apportioning would be used for calculation of emission reductions during that period.

Emergency preparedness

The project activity will not result in any unidentified activity that can result in substantial emissions from the project activity. No need for emergency preparedness in data monitoring is visualized.

Personnel training

Version 05.0

In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the staff (CDM team) will be trained. The plant helpers will be trained in equipment operation, data recording, reports writing, operation and maintenance and emergency procedures in compliance with the monitoring plan.

SECTION C. Crediting period

C.1. Type of crediting period

Renewable crediting period of 7 years 00 Months has been opted for the project activity. This is the first crediting period of the project activity.

C.2. Start date of crediting period

30/12/2020 or Date of submission of complete request for registration by the DOE whichever is later.

C.3. Duration of crediting period

07 Years 00 Months

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
05.0	6 July 2017	Revision to: <ul style="list-style-type: none"> • Add a row to indicate bundle type in the cover page; • Add a section on the establishment of baseline scenario; • Remove a row on project participants in the cover page and an appendix on contact information of project participants.
04.0	5 July 2017	Revision to: <ul style="list-style-type: none"> • Modify the elements in the cover page; • Remove the sections on Parties and project participants and the start and duration of bundle; • Change the symbol from F-CDM-SSC-BUN to CDM-SSC-BUN-FORM; • Make editorial improvement.
03.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the CDM small-scale project activities bundling form" (EB 66, Annex 23).
02.0	24 February 2006	EB 23, Annex 26
01.0		Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: SSC project activities, bundled project activities