140 MW Solar Photovoltaic Project in Rajasthan

Project Title	140 MW Solar Photovoltaic Project in Rajasthan
Version	01
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Table of Contents

1 PROJECT DETAILS

1.1 Summary Description of the Project

The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source. Rising Bhadla 1 Private Ltd. and Rising Bhadla 2 Private Ltd. are the promoter of the proposed project activity. The project activity involves installation of 140 MW solar power project at Bhadla, Jodhpur, Rajasthan. The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 2,42,688 tCO_2e per year, thereon displacing 251,412 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant.

The details of the project and the state of installation are mentioned in the table:-

Project Participants Name	**Capacity in MW (AC)**	**Connection with Grid**	**State**	**Usage**
Rising Bhadla 1 Private Ltd.	70 MW	Indian Grid	Rajasthan	Sale to Grid
Rising Bhadla 2 Private Ltd.	70 MW			

Sectoral Scope: 01 : 01 - Energy industries (renewable / non-renewable sources)
Project Type: (i) : I - Renewable Energy Projects
Project Category Version 17.0 : Grid-connected electricity generation from renewable sources ACM0002-

Tools referred with above methodology are:

Tool to calculate the emission factor for an electricity system[1] - Version 05.0 (EB 87, Annex 09)

Scenario existing prior to the implementation of project activity:

The scenario existing prior to the implementation of the project activity, is electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

Baseline Scenario:

As per the applicable methodology, a Greenfield power plant is defined as "*a new renewable energy power plant that is constructed and operated at a site where no renewable energy power plant was operated prior to the implementation of the project activity*".

As the project activity falls under the definition of a Greenfield power plant, the baseline scenario as per paragraph 24 of Section 5.2.1 of applied methodology is the following:

If the project activity is the installation of a Greenfield power plant, the baseline scenario is 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, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

[1] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf

Hence, pre-project scenario and baseline scenario are the same.

Sustainable development indicators

The National CDM Authority (NCDMA), which is the Designated National Authority (DNA) for the Government of India (GOI) under the Ministry of Environment and Forests (MoEF), has mentioned four indicators for the sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects from India[2].Thus the project's contribution towards sustainable development has been addressed based on the following sustainable development aspects:

Social well-being

The project activity provided / provides job opportunity to local people during erection, commissioning and maintenance of the solar project. Frequency of visiting villages and nearby areas by skilled, technical and industrialist increase due to installation /site visit/operation and maintenance work related to solar plant. This directly and indirectly positively effects the economy of villages and nearby area.

Environmental well-being

Solar power is one of the cleanest renewable energy powers and does not involve any fossil fuel. There are no GHG emissions. The impact on land, water, air and soil is negligible. Thus the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.

Economic well-being

The project activity generates permanent and temporary employment opportunity within the vicinity of the project. The electricity supply in the nearby area improves which directly and indirectly improves the economy and life style of the area.

Technological well-being

The project activity is step forward in harnessing the untapped solar potential and further diffusion of the solar technology in the region. The project activity leads to the promotion and demonstrates the success of solar projects in the region which further motivate more investors to invest in solar power projects. Hence, the project activity leads to technological well-being.

1.2 Sectoral Scope and Project Type

The project activity falls under the following Sectoral scope and Project Type:

Sectoral Scope : 01 - Energy industries (renewable / non renewable sources)
Project Type : I - Renewable Energy Projects
Project Category : Grid-connected electricity generation from renewable sources ACM0002-Version 17.0[3]

The project is not a grouped project activity.

[2] http://www.cdmindia.gov.in/approval_process.php

[3] https://cdm.unfccc.int/methodologies/DB/8W400U6E7LFHHYH2C4JR1RJWWO4PVN

1.3 Project Proponent

Organization name	Rising Bhadla 1 Private Ltd
Contact person	Ayush Bhargava
Title	Assistant Manager- Project Management
Address	S-18 Second Floor Green Park Extension Delhi-110016 India
Telephone	-
Email	-

Organization name	Rising Bhadla 2 Private Ltd
Contact person	Ayush Bhargava
Title	Assistant Manager- Project Management
Address	S-18 Second Floor Green Park Extension Delhi-110016 India
Telephone	--
Email	-

1.4 Other Entities Involved in the Project

Not Applicable

1.5 Project Start Date

Start date of the project activity is the foremost date of interconnection with the grid i.e. 05-07-2017. This is the date of commissioning of 40 MW out of proposed 2 x 70 MW i.e. 140 MW which is the total capacity of the project activity.

1.6 Project Crediting Period

Crediting Period Start date: 05-July-2017

Crediting Period End date: 04-July-2027

The project activity adopts renewable crediting period of 10 years period which can be renewed for maximum 2 times.

1.7 Project Scale and Estimated GHG Emission Reductions or Removals

The project is a large scale project that involves setting up of 140.0 MW of Solar power project.

Project Scale	
Project	✓

Large project	

As the estimated GHG emission reductions or removal per year is 242,688 tCO_2e which is less than 300,000 tonnes of CO_2e per year, thus the project falls in the category of Project.

Year	Estimated GHG emission reductions or removals (tCO_2e)
Year 1	2,42,688
Year 2	2,42,688
Year 3	2,42,688
Year 4	2,42,688
Year 5	2,42,688
Year 6	2,42,688
Year 7	2,42,688
Year 8	2,42,688
Year 9	2,42,688
Year 10	2,42,688
Total estimated ERs	24,26,880
Total number of crediting years	10 years
Average annual ERs	2,42,688

1.8 Description of the Project Activity

The proposed project activity involves the installation of Solar PV project. The total installed capacity of the project is 140 MW; which involves operation of two units of 70 MW of Solar PV plant each located at Rajasthan state in India. The project is promoted by **Rising Bhadla 1 Private Ltd and Rising Bhadla 2 Private Ltd** which are the group companies of Rising Sun Energy Pvt Ltd.

The Project activity is a new facility (Greenfield) and the electricity generated by the Project will be exported to the Indian electricity grid. The Project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. The Project Proponent plans to avail the VCS benefits for the Project.

In the Pre- project scenario the entire 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.

The project shall result in replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 2,42,688 tCO_2e per year, thereon displacing 2,51,412 MWh/year amount of electricity from the gird.

Solar PV Project Technology Details –

The project activity aims to harness solar energy through installation of PV with total installed capacity of 140 MW (AC).

Proposed technical specification of 40 MW plant interconnection with grid on 05-07-2017 at Rising Bhadla 1 Private Ltd. Rest of the plant of Rising Bhadla 1 Private limited and Rising Bhadla 2 Private limited is in final completion phase.

Sl. No.	Technical details of the equipment[4]	Comments
1	Technology Used	Multi Crystalline
2	Rating of each module (Wp)	315 Wp to 330 Wp
3	Angle from horizontal at which array is installed	5 Deg Angle
4	Number of modules installed of each type	315 Wp- 3120 Nos. 320 Wp 36192 Nos. 325 Wp- 53040 Nos 330 Wp- 61152 Nos.
5	Sources(s) of the modules installed of each type	Canadian Solar 315 Wp, 320 Wp 325 Wp, 330 Wp
6	Number of the Power Conditioning Units (PCUs) installed	1000 KW- 70 Nos
7	Sources of PCUs (Name of Supplied)	ABB India Limited

Section 2.3 and Section 4 mentions information related to metering & monitoring system.

1.9 Project Location

Both the solar plant of respective project investor are located at a single region and the details are as follows[5]:

Location of the Plant	Village - Bhadla, Tehsil - Phalodi, District- Jodhpur, State-Rajasthan
Location details	Latitude :27°29' N Longitude :71°54'E Elevation :180 m above MSL
Distance from District Headquarter	159 km from Jodhpur
Access by Road	Connected by Road- NH65
Access by Rail	Nearest Railway station- Phalodi: 83 km
Access by Air	Nearest Airport – Jodhpur
Telecommunication	Fairly available
Land	Approximately 140ha land available for 70 MW Solar PV plant.
Climate	Annual Rainfall – 3 mm Max Temp: 50°C 13 Min Temp: -3°C Max Relative Humidity: 100 % Min Relative Humidity: 5% Wind Speed: 1.4 M/s (Min) to 5.7 M/s (Max)

[4] It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 140 MW (AC).
[5] Sourced from DPR of the project activity.

Figure 1. State and district Map of Rajasthan and Jodhpur

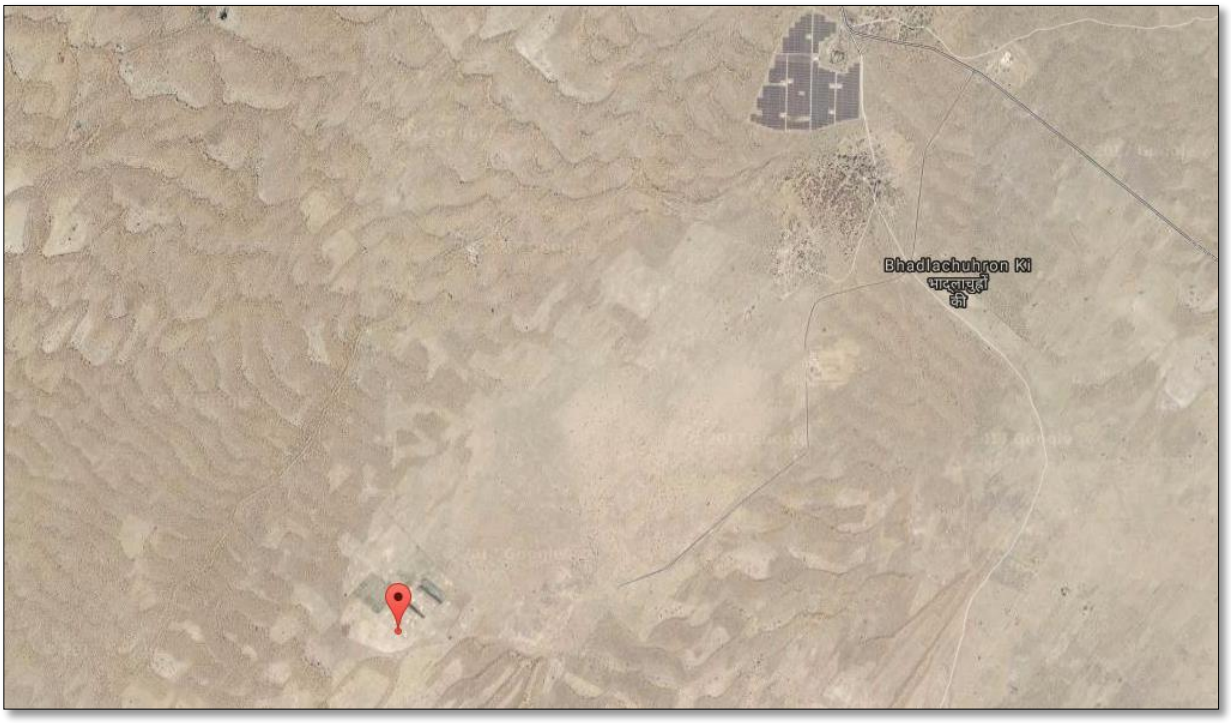


Figure 2 Pin point drop on Google maps

1.10 Conditions Prior to Project Initiation

The project is a Greenfield solar power project and does not involve generation of GHG emissions for the purpose of their subsequent reduction, removal or destruction.

1.11 Compliance with Laws, Statutes and Other Regulatory Frameworks

The Project has received necessary approvals for development and commissioning for the proposed 2 x 70 MW Solar PV project from the state Nodal agencies and is in compliance to the local laws and regulations.

1.12 Ownership and Other Programs

1.12.1 Project Ownership

The Project is owned by **Rising Bhadla 1 Private Ltd** and **Rising Bhadla 2 Private Ltd**, hence it possess right of use of ER credits. The Ownership is demonstrated through the following documents.

1) Installation report for Solar Plant in the name of respective PP issued by RRECL, Jodhpur.

2) Power Purchase Agreement with NTPC Ltd (NTPC has been identified by the Government of India as implementation agency for setting up of Grid- connected Solar PV Power Projects) for sale of electricity by the respective PP.

1.12.2 Emissions Trading Programs and Other Binding Limits

Net GHG emission reductions or removals generated by the Project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions in any Emission Trading program or other binding limits.

1.12.3 Other Forms of Environmental Credit

The Project has no intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

1.12.4 Participation under Other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs. The project is seeking registration only in VCS program.

1.12.5 Projects Rejected by Other GHG Programs

The Project is not rejected by other GHG programs.

1.13 Additional Information Relevant to the Project

Eligibility Criteria

This is not a grouped project activity. Thus, this section is not applicable for this project.

Leakage Management

Not applicable to the project activity.

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description

Sustainable Development

Contribution to sustainable development:

Ministry of Environment and Forests, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways.

- **Social well-being:** The project would help in generating employment opportunities during the construction and operation phases. The project activity will lead to development in infrastructure in the region like development of roads and also may promote business with improved power generation.

- **Economic well-being:** The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity will also help to reduce the demand supply gap in the state.

  The project activity will generate power using zero emissions Solar PV based power generation which helps to reduce GHG emissions and specific pollutants like SOx, NOx, and SPM associated with the conventional thermal power generation facilities.

- **Technological well-being:** The successful operation of project activity would lead to promotion of Solar based power generation and would encourage other entrepreneurs to participate in similar projects

Environmental well-being: Solar being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions.

Further Information

Not Applicable

2 APPLICATION OF METHODOLOGY

2.1 Title and Reference of Methodology

Title : Grid-connected electricity generation from renewable sources

Reference : The project activity meets the eligibility criteria of large scale project as it is more than 15MW

Methodology : ACM0002: Grid-connected electricity generation from renewable sources - Version 17.0[6]

[6] http://cdm.unfccc.int/methodologies/DB/8W400U6E7LFHHYH2C4JR1RJWWO4PVN

Type I : Energy industries (renewable / non-renewable sources)
Category : Approved Consolidated Methodology (ACM0002)

Tools referred with above methodology and applicable for project activity are:

- Tool to calculate the emission factor for an electricity system[7] - Version 05.0 (EB 87, Annex 09)
- Methodological Tool- Tool for the demonstration and assessment of additionality[8] - Version 07.0.0 (EB 70, Annex 08)

2.2 Applicability of Methodology

The project activity involves generation of grid connected electricity from renewable solar energy. The project activity has a proposed capacity of 2 x 70 MW (AC) which will qualify for a large scale CDM project activity under Type-I of the large scale methodologies. The project status is corresponding to the methodology ACM0002 version 17.0 and applicability of methodology are discussed below.

[7] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf
[8] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

Applicability Criterion	Project Case
1. This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s)	The project activity is a Renewable Energy Project i.e. Solar Power Project which falls under applicability criteria option 1 (a) i.e., "Install a Greenfield power plant". Hence the project activity meets the given applicability criterion.
2. The methodology is applicable under the following conditions: (a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; (b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	The option (a) of applicability criteria 2 is applicable as project is renewable energy solar power plant/unit.
3. In case of hydro power plants, one of the following conditions shall apply:[9] (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m^2; or (c) The project activity results in new single or multiple reservoirs and the power density,	The project is installation of new solar based electricity generation plants (not a hydro power plant). Hence this criteria is not applicable.

[9] Project participants wishing to undertake a hydroelectric project activity that result in a new reservoir or an increase in the volume of an existing reservoir, in particular where reservoirs have no significant vegetative biomass in the catchments area, may request a revision to the approved consolidated methodology.

	calculated using equation (3), is greater than 4 W/m^2; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m^2, all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m^2; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m^2 shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	
4.	In the case of integrated hydro power projects, project proponent shall:	The project is solar power project and thus the criterion is not applicable to this project activity.
5.	Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or	The project is solar power project and thus the criterion is not applicable to this project activity.
6.	Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	The project is solar power project and thus the criterion is not applicable to this project activity.

7.	The methodology is not applicable to: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; (b) Biomass fired power plants/units.	(a) The project activity is Greenfield and there is no switching of fossil fuel to renewable energy. Hence the criteria is not applicable to the project activity (b) The project is not a biomass fired power plant. Hence the criteria is not applicable to the project activity.
8.	In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	Not applicable, the solar project is a Green field project activity and this project is not the enhancement or up gradation project.
9.	In addition, the applicability conditions included in the tools referred to below apply.[10]	Please refer tables below.

Tool to calculate the emission factor for an electricity system[11] - Version 05.0 (EB 87, Annex 09)

Applicability Criterion	**Project Case**
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The project is a grid connected Greenfield Solar power project and thus the tool is applicable.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in "Appendix 2: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total	Steps involved in calculation of Emission Factor is included in section B.6.3 of the PDD as per the requirement of the tool

[10] The condition in the "Combined tool to identify the baseline scenario and demonstrate additionality" that all potential alternative scenarios to the proposed project activity must be available options to project participants; does not apply to this methodology, as this methodology only refers to some steps of this tool.

[11] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf

Applicability Criterion	Project Case
electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	Project is located in non-Annex I country and hence the tool is applicable
Under this tool, the value applied to the CO2 emission factor of biofuels is zero.	The project is a Solar project and there is no involvement of biofuels.

- Methodological Tool- Tool for the demonstration and assessment of additionality- Version 07.0.0 (EB 70, Annex 08)

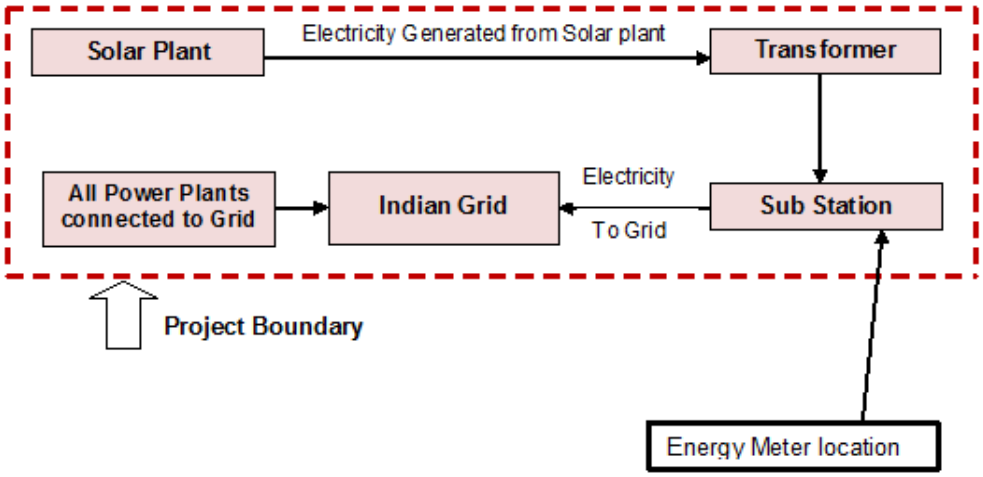
  Applicability Criteria has been demonstrated in section on additionality below.

  The project activity qualifies as Type I during every year of the crediting period in accordance with applicable provisions for project activity eligibility as discussed above. Also the total installed capacity of project activity is 140 MW which is applicable as per large scale project activities methodology ACM0002: Grid-connected electricity generation from renewable sources Version 17.0. The project capacity will be always remain the same and hence the project activity will always be large scale project activities throughout the crediting period and thereafter.

2.3 Project Boundary

As per ACM002 version 17 - “The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to”.

The project boundary includes the solar project, sub-stations, grid and all power plants connected to grid. The proposed project activity will evacuate power to the Indian grid. Therefore the entire Indian grid and all connected power plants have been considered in the project boundary for the proposed VCS project activity.



The GHG emission sources considered for the project boundary and their explanations are as follows:

Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected electricity generation.	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
		Other	No	No CO_2 emissions are emitted from the project
Project	Greenfield Solar PV Power Project Activity.	CO_2	No	No CO_2 emissions are emitted from the project
		CH_4	No	Project activity does not emit CH_4
		N_2O	No	Project activity does not emit N_2O
		Other	No	Project activity does not emit other forms of GHG emissions

2.4 Baseline Scenario

As per the approved consolidated Methodology ACM0002 (Version 17.0, EB 89, Annex 1) para 24: *"If the project activity is the installation of a Greenfield power plant, the baseline scenario is 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, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".*

The project activity involves setting up of solar projects to harness the power of sun 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 grid, which is fed mainly by fossil fuel fired plants.

In the absence of the project activity, the equivalent amount of power would have been drawn from the Indian grid. Hence, the baseline for the project activity is the equivalent amount of power from the Indian 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) and build margin (BM). Calculations for this combined margin must be based on data from an official source (where available) and made publically available. The CEA database version 12 is the latest available data at the time of PD submission to DOE for validation, hence same is considered for emission factor calculations.

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

Parameter	Value	Nomenclature	Source
$EF_{grid,y}$	0.9653 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 12.0, May 2017 published by Central Electricity Authority (CEA), Government of India
$EF_{grid,OM,y}$	0.9843 tCO_2/MWh	Operating margin CO_2 emission factor for the project electricity system in year y	Calculated as the last 3 year (2013-14, 2014-15, 2015-16) generation-weighted average, sourced from Baseline CO_2 Emission Database, Version 12.0, May 2017 published by Central Electricity Authority (CEA), Government of India
$EF_{grid,BM,y}$	0.9083 tCO_2/MWh	Build margin CO_2 emission factor for the project electricity system in year y	Baseline CO_2 Emission Database, Version 12.0, May 2017 published by Central Electricity Authority (CEA), Government of India

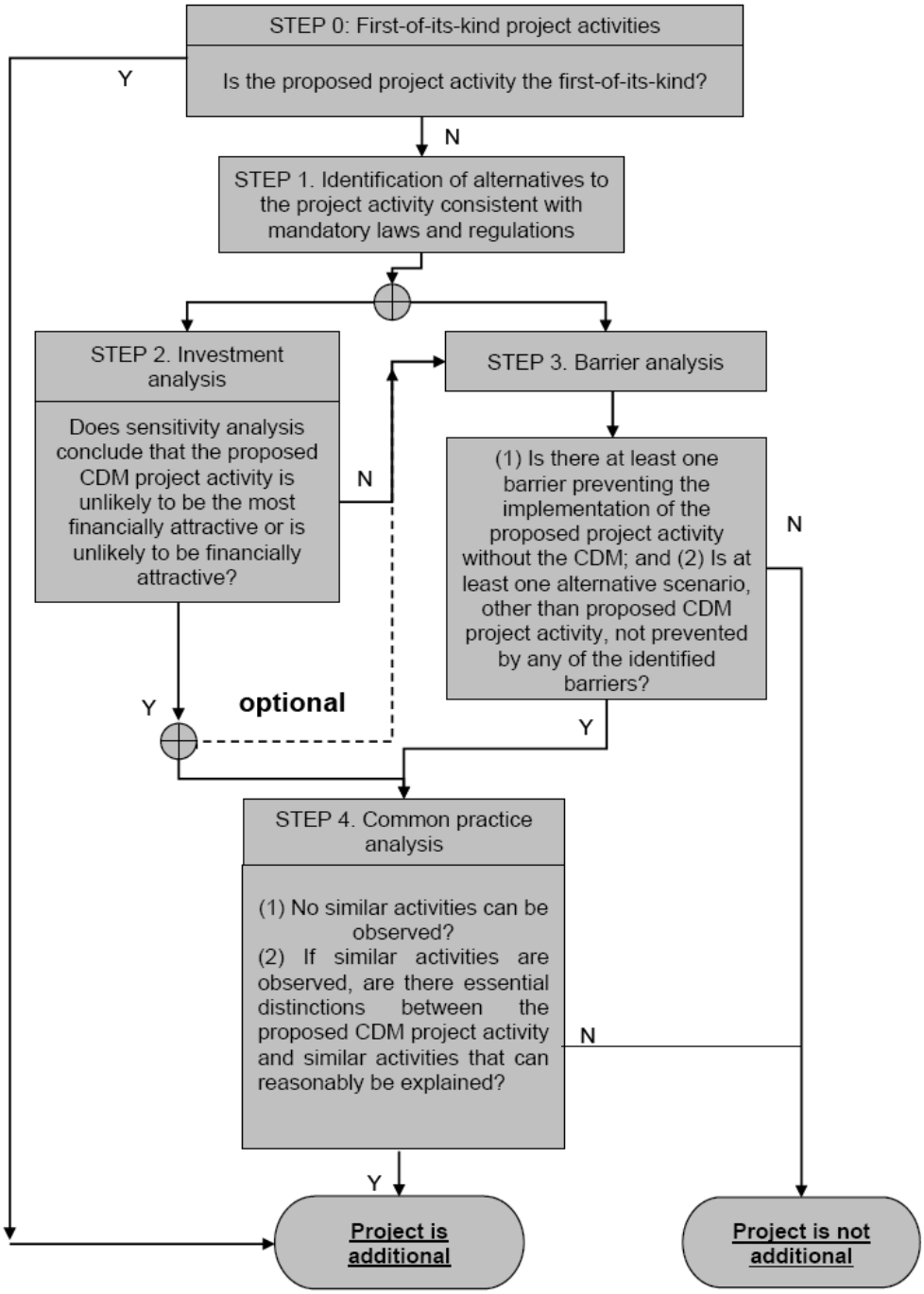
2.5 Additionality

The table below is only applicable if the proposed project activity is a type of project activity which is deemed automatically additional, as defined by the applied approved methodology or standardized baseline.

Specify the methodology or standardized baseline that establish automatic additionality for the proposed project activity (including the version number and the specific paragraph, if applicable).	NA
Describe how the proposed project activity meets the criteria for automatic additionality in the relevant methodology or standardized baselines.	NA

The proposed VCS project generates power using Solar PV energy which is a renewable, zero emission source of energy. Baseline considerations for the project are based on approved consolidated baseline methodology ACM0002 (Version 17.0). The methodology requires the project investor to determine the additionality based on "Methodological Tool- Tool for the demonstration and assessment of additionality", Version 7.0.0. The step-wise approach to establish

additionality of the project activity has been followed, details of which are provided in the following paragraphs:



Step 0: Demonstration whether the proposed project activity is the first-of-its-kind
The proposed project activity is not the first of its kind. Hence, this step is not applicable.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

As per the applied methodology ACM0002 version 17.0; Para 24, if the project activity is the installation of a Greenfield power plant, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plant and by the addition of new generation sources.

As the baseline scenario is prescribed by applied methodology, hence no further analysis is carried out to identify alternatives.

Step 2: Investment Analysis

Sub-step 2a: Determine appropriate analysis method

As per "Methodological Tool- Tool for the demonstration and assessment of additionality[12]" (version 07.0.0), for financial analysis of the project, the following three options are available:

Option I: Simple Cost Analysis
Option II: Investment Comparison Analysis
Option III: Benchmark Analysis

The project will generate revenues from sale of electricity, therefore Option I is not applicable. Option II also does not apply since there is no comparable investment alternative available to the project participant. The most appropriate financial analysis method is therefore option III: the benchmark analysis, where the returns on investment in the project activity are compared to benchmark returns that are available to any investors in the country.

Sub-step 2b: Option III. Apply benchmark analysis

Project participant have considered Post-Tax Equity IRR for investment analysis at the time of decision-making. As Project participant is only interested in the returns project is generating on the portion of investment costs, which is financed by them in the form of equity.

Since EB 92 Annex 5 (Methodological Tool: Investment Analysis Version 7) was applicable at the time of investment decision made (i.e on 16/11/2015) for the project activity, the same is referred for default value for cost of equity. As per Para 16 of EB 92, Annex 5 states that Required/expected returns on equity are appropriate benchmarks for an equity IRR. Therefore, the Expected return on equity is considered appropriate benchmark.

Accordingly, the post-tax Equity IRR has been considered as the relevant financial indicator for Investment Analysis.

Default Value Benchmark:

As per para 20 of EB 92, Annex 5 the cost of equity is determined by selecting the values provided in the Appendix, i.e. Default values for cost of equity (expected return on equity) is presented below:

Appendix in EB 92, Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.06%**

The Required return on equity (benchmark) was computed in the following manner:

Nominal Benchmark[13] = {(1+Real Benchmark)*(1+Inflation rate)}-1

[12] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v7.0.pdf
[13] As per Fisher Equation, https://en.wikipedia.org/wiki/Fisher_equation

Where:
- Default value for Real Benchmark = 11.06% (as per Appendix of EB 92, Annex 5)

- Inflation Rate forecast for by Reserve Bank of India (RBI) (i.e. Central Bank of India) for India & in case where RBI Inflation forecast was not available Average Inflation rate forecast for India has been sourced from IMF web site.

Benchmark estimation:

Appendix in EB92, Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.06%**

Inflation Forecast for India as per RBI website[14]:

Since RBI publishes the inflation forecast for 5 years and 10 years, PP has considered the maximum 10 year inflation considering the renewable crediting period of total 21 years.

Project Investor	**Inflation Forecast**	**Benchmark**
	10 Years	**10 Years**
Rising Bhadla 1 Private Ltd.	3.60%	15.10%
Rising Bhadla 2 Private Ltd.	3.60%	15.10%

Thus benchmark of **15.10%** has been selected for this project activity.

Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III):

Financial spread sheets for the key assumptions (web links & sources of input parameters) supporting the financial projections is still under development phase and would be submitted and updated at the time of final validation.

Step (2): Identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:

(a) The projects are located in the applicable geographical area;

(b) The projects apply the same measure as the proposed project activity;

(c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;

(d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;

(e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;

(f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

Identification of the similar projects (CDM and non-CDM) is carried out as per sub-steps of Step (2) as follows:

[14] https://rbi.org.in/Scripts/PublicationsView.aspx?id=16696

a) As the projects are located in Rajasthan state of India, therefore, projects in the geographical area of Rajasthan have been chosen for analysis. Each state have different policies regarding renewable energy, hence Rajasthan state is considered as geographical region for common practise analysis.

b) The project activity is a green-field solar power project and uses measure (b) "Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies". Therefore, projects applying same measure (b) are candidates for similar projects.

c) The energy source used by the project activity is solar. Hence, only solar energy projects have been considered for analysis.

d) The project activity produces electricity; therefore, all power plants that produce electricity are candidates for similar projects.

e) The capacity range of the projects is within the applicable capacity range from 35 MW to 105 MW.

f) The start date of the project activity is 29-Jul-2017. Therefore projects, which have started commercial operation before 29-Jul-2017, have been considered for analysis.

Numbers of Similar projects identified, which fulfil above-mentioned conditioned are
N_{solar}= 4

Step (3): Within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all}.

CDM project activities, which have got registered or are under validation have been excluded in this step. The list of the power plants identified is provided to the DOE. After excluding the registered and under validation projects the total number of projects. One project of 40 MW by Dahanu Solar Power Pvt. Ltd was found as CDM Registered.

N_{all} = 3

Step (4): Within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number N_{diff}.

As per the tool on Common Practice, the project activities have been separated from the different technologies on the basis two criteria:
1. Size of Installation
2. Investment climate on the date of the investment decision

Hence, projects where either of the conditions is satisfied those projects are counted for calculating N_{diff} projects.

N_{diff} = 0

Step (5): Calculate factor $F=1-N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

Calculate $F=1-N_{diff}/N_{all}$
$F = 1-(0/3) = 1$

As per methodological tool "common practise" version 03.1, the proposed project activity is a "common practice" within a sector in the applicable geographical area if the factor F is greater than 0.2 and Nall-Ndiff is greater than 3.

Thus if both conditions are fulfilled, then project activity will be a common practise otherwise, the project activity is treated as not a common practise.

Outcome of Common Practise analysis:

As,
i. F = 1; is greater than 0.2
ii. N_{all}-N_{diff}= 3; is not greater than 3

The project activity does not satisfy second condition. Hence, project activity is not a common practice.

The proposed project activity is not a "common practice" within a sector in the applicable geographical area.

The above discussions show that solar power development is not a common practice and the project activity is not financially attractive; hence the project activity is additional.

2.6 Methodology Deviations

There is no methodology deviation.

3 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

3.1 Baseline Emissions

As per the approved consolidated Methodology ACM0002 (Version 17.0, EB 89, Annex 1) para 44:

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid- connected power plants. The baseline emissions are to be calculated as follows:

$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$

Where:

BE_y = Baseline emissions in year y (t CO_2/yr)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$ = Combined margin CO2 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" (t CO_2/MWh)

As per methodology, combined grid emission factor as per the "Tool to calculate the emission factor for an electricity system" version 05 is calculated as below.

CO_2 Baseline Database for the Indian Power Sector, Version 12, May 2017[15] published by Central Electricity Authority (CEA), Government of India has been used for the calculation of emission reduction.

As per Methodological tool: Tool to calculate the emission factor for an electricity system (Version 05.0, EB 87, Annex 9), following six steps have been followed:

(a) **Step 1:** Identify the relevant electricity systems;

(b) **Step 2:** Choose whether to include off-grid power plants in the project electricity system (optional);

(c) **Step 3:** Select a method to determine the operating margin (OM);

(d) **Step 4:** Calculate the operating margin emission factor according to the selected method;

(e) **Step 5:** Calculate the build margin (BM) emission factor;

(f) **Step 6:** Calculate the combined margin (CM) emission factor.

Step 1: Identify the relevant electricity systems

As described in tool "For determining the electricity emission factors, identify the relevant project electricity system. Similarly, identify any connected electricity systems". It also states that "If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used". Keeping this into consideration, the Central Electricity Authority (CEA), Government of India has divided the Indian Power Sector into five regional grids viz. Northern, Eastern, Western, North-eastern and Southern.

However since August 2006, however, all regional grids except the Southern Grid had been integrated and were operating in synchronous mode, i.e. at same frequency. Consequently, the Northern, Eastern, Western and North-Eastern grids were treated as a single grid named as NEWNE grid from FY 2007-08 onwards for the purpose of this CO2 Baseline Database. As of 31 December 2013, the Southern grid has also been synchronised with the NEWNE grid, hence forming one unified Indian Grid. Since the project supplies electricity to the Indian grid, emissions generated due to the electricity generated by the Indian grid as per CM calculations will serve as the baseline for this project.

Table: Geographical Scope of Indian Electricity Grid

Northern	Eastern	Western	North-Eastern	Southern
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Andhra Pradesh
Delhi	Jharkhand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	West Bengal	Dadar& Nagar Haveli	Meghalaya	Tamil Nadu
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Puducherry

[15] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver12.pdf

Punjab	Andaman & Nicobar	Maharashtra	Nagaland	Lakshadweep
Rajasthan		Goa	Tripura	
Uttar Pradesh				
Uttarakhand				

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

Project participants may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.
Option II: Both grid power plants and off-grid power plants are included in the calculation.

The Project Participant has chosen only grid power plants in the calculation.

Step 3: Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods, which are described under Step 4:

(a) Simple OM; or

(b) Simple adjusted OM; or

(c) Dispatch data analysis OM; or

(d) Average OM.

The data required to calculate Simple adjusted OM and Dispatch data analysis OM is not possible due to lack of availability of data to project developers. The choice of other two options for calculating operating margin emission factor depends on generation of electricity from low-cost/ must-run sources. In the context of the methodology low cost/must run resources typically include hydro, geothermal, wind, low cost biomass, nuclear and solar generation.

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)

	2011-12	2012-13	2013-14	2014-15	2015-16
India	19.6%	16.9%	18.6%	16.8%	15.1%

Data Source: Central Electricity Authority (CEA) database Version 12, May'2017[16]

The above data clearly shows that the percentage of total grid generation by low-cost/ must-run plants (on the basis of average of five most recent years) for the Indian grid is less than 50 % of the total generation. Thus the Average OM method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation.

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

For the simple OM, the simple adjusted OM and the average OM, the emissions factor can be calculated using either of the two following data vintages:

[16] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver12.pdf

(a) **Ex-ante option:** if the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required.

OR

(b) **Ex-post option:** if the ex-post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

PP has chosen ex-ante option for calculation of Simple OM emission factor using a 3-year generation-weighted average, based on the most recent data available at the time of submission of the PD to the DOE for validation.

OM determined at validation stage will be the same throughout the crediting period. There will be no requirement to monitor & recalculate the emission factor during the crediting period.

Step 4: Calculate the operating margin emission factor ($EF_{grid,OMSimple,y}$) according to the selected method
The operating margin emission factor has been calculated using a 3 year data vintage:

Net Generation in Operating Margin (GWh) (incl. Imports)			
	2013-14	2014-15	2015-16
INDIAN Grid	7,25,037	8,10,011	8,71,740

Simple Operating Margin (tCO_2/MWh) (incl. Imports)			
	2013-14	2014-15	2015-16
INDIAN Grid	1.00	0.99	0.96

Weighted Generation Operating Margin	
INDIAN Grid	**0.9843**

Step 5: Calculate the build margin (BM) emission factor ($EF_{grid,BM,y}$)

As per Methodological tool: "Tool to calculate the emission factor for an electricity system" (Version 05.0, EB 87, Annex 9) para 70:

In terms of vintage of data, project participants can choose between one of the following two options:

(a) **Option 1 -** for the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of PD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

(b) **Option 2 -** For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

Option 1 as described above is chosen by PP to calculate the build margin emission factor for the project activity. BM is calculated ex-ante based on the most recent information available at the time of submission of PD and is fixed for the entire crediting period.

Build Margin (tCO_2/MWh) (not adjusted for imports)	
	2015-16
INDIAN Grid	**0.9083**

Step 6: Calculate the combined margin (CM) emission factor ($EF_{grid,CM,y}$)
As per Methodological tool: "Tool to calculate the emission factor for an electricity system" (Version 05.0, EB 87, Annex 9) para 79:

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

(a) Weighted average CM; or

(b) Simplified CM.

PP has chosen option (a) i.e weighted average CM to calculate the combined margin emission factor for the project activity.
The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$$

Where:
$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (t CO_2/MWh)
$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (t CO_2/MWh)
W_{OM} = Weighting of operating margin emissions factor (per cent)
W_{BM} = Weighting of build margin emissions factor (per cent)

The following default values should be used for W_{OM} and W_{BM}:

Wind and solar power generation project activities: W_{OM}= 0.75 and W_{BM}= 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods. Since project activity is of solar power generation, the above weightage has been considered for OM and BM.

Therefore, $EF_{grid,CM,y}$ = 0.9843*0.75 + 0.9083*0.25
= 0.9653 t CO_2/MWh

Baseline emission factor (EF_y):

The baseline emission factor is calculated using the combined margin approach as described in Step 6 above:

Therefore, $EF_y = EF_{grid,CM,y}$= 0.9653 t CO_2/MWh.

BE_y = 251,412 x 0.9653 = 2,42,688 tCO_2

3.2 Project Emissions

As per the approved consolidated Methodology ACM0002 (Version 17.0, EB 89, Annex 1) para 36: "For most renewable energy power generation project activities, PEy = 0. However, some project

activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$

Where:
PE_y = Project emissions in year y (t CO_2e/yr)
$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (t CO_2/yr)
$PE_{GP,y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO_2e/yr)
$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (t CO_2e/yr)

As the project activity is the installation of a new grid-connected Solar PV Power plant and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore $PE_{FF,y}$, $PE_{GP,y}$, $PE_{HP,y}$ are equal to zero and thus, $PE_y = 0$.

3.3 Leakage

No other leakage emissions are considered. The emissions potentially arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport etc.) are neglected.

3.4 Net GHG Emission Reductions and Removals

Reductions are calculated as follows:

$ER_y = BE_y – PE_y$

Where:

ER_y	=	Emission reductions in year *y* (t CO_2e/yr)
BE_y	=	Baseline emissions in year *y* (t CO_2/yr)
PE_y	=	Project emissions in year *y* (t CO_2e/yr)

Therefore, Net GHG Emission Reductions and Removals are calculated as follows:
$ER_y = BE_y – PE_y$

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
Year 1	2,42,688	0	0	2,42,688
Year 2	2,42,688	0	0	2,42,688
Year 3	2,42,688	0	0	2,42,688
Year 4	2,42,688	0	0	2,42,688
Year 5	2,42,688	0	0	2,42,688
Year 6	2,42,688	0	0	2,42,688
Year 7	2,42,688	0	0	2,42,688
Year 8	2,42,688	0	0	2,42,688

Year 9	2,42,688	0	0	2,42,688
Year 10	2,42,688	0	0	2,42,688
Total	24,26,880	0	0	24,26,880

4 MONITORING

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,OM,y}$
Data unit	tCO_2/MWh
Description	Operating Margin CO_2 emission factor in year y
Source of data	Calculated from CEA database, Version 12, May 2017[17]
Value applied	0.9843
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per "Tool to calculate the emission factor for an electricity system, version 05" as 3-year generation weighted average using data for the years 2013-14, 2014-15 & 2015-16. The data are obtained from "CO_2 Baseline Database for Indian Power Sector" version 12, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO_2/MWh
Description	Build Margin CO_2 emission factor in year y
Source of data	Calculated from CEA database, Version 12, May 2017[17]
Value applied	0.9083
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per "Tool to calculate the emission factor for an electricity system, version 05" as per the latest data available for the most recent year 2015-16. The data is obtained from "CO_2 Baseline Database for Indian Power Sector" version 12, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2/MWh

[17] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver12.pdf

Description	Combined Margin CO_2 emission factor in year y
Source of data	Calculated from CEA database, Version 12, May 2017[17]
Value applied	0.9653
Justification of choice of data or description of measurement methods and procedures applied	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ Where: $EF_{grid,BM,y}$= Build margin CO_2 emission factor in year *y* (tCO_2/MWh) $EF_{grid,OM,y}$= Operating margin CO_2 emission factor in year *y* (tCO_2/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM}= Weighting of build margin emissions factor (%) = 25%
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

4.2 Data and Parameters Monitored

Data / Parameter	**$EG_{PJ,y}$**
Data unit	MWh/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
Source of data	Monthly joint meter reading reports
Description of measurement methods and procedures to be applied	**Plant end dedicated metering:** The electricity exported / supplied by the plant is first metered by plant end dedicated main & check meters (ABT Meters) having accuracy class of 0.2s. This meter also measures electricity imported by the plant from the grid. The monthly joint meter reading report at the plant end meter records the initial & final reading of export values by the plant. The monthly export for a given month is arrived as: Monthly Export = (Final Reading – Initial Reading) × Meter M.F. Similarly the import for a given month is arrived as: Monthly Import = (Final Reading – Initial Reading) × Meter M.F. **Monthly sample apportioning procedure:** The plant-wise monthly export (billable) values are calculated based on the respective export factors. The export factor for the project plant is calculated as a ratio of the monthly export of the project plant recorded at plant end by the dedicated meter. The monthly values of electricity supplied/exported to the grid by the project activity are aggregated on annual basis. Similar procedure is applied for monthly import values. The net electricity supplied to the grid by the project plant in a given month is calculated by subtracting value of import kWh from export kWh.

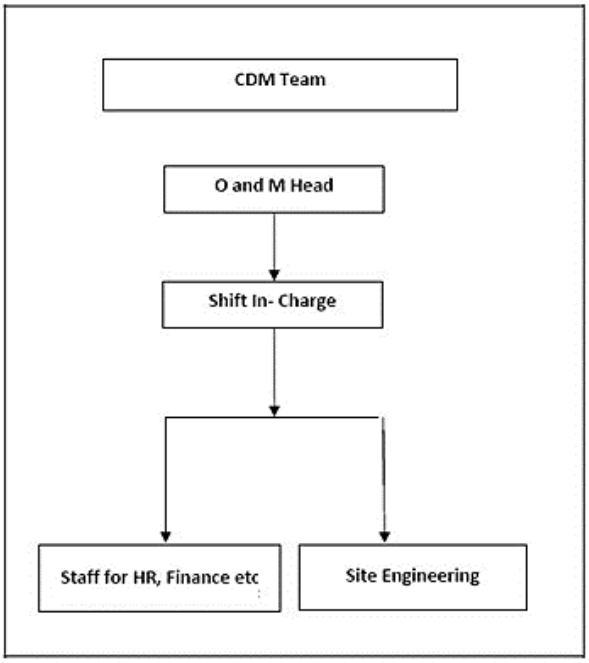
	Thus, Net electricity supplied to the grid by the project plant in a given month = Export, kWh– Import, kWh The monthly values of net electricity supplied to the grid by the project activity is aggregated on annual basis to get the value of EG facility, y. All above JMRs will be considered in the calculation.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value applied	2,51,412 (estimated)
Monitoring equipment	The electricity exported / supplied by the plant is first metered by plant end dedicated main & check meters (ABT Meters) having accuracy class of 0.2s. This meter also measures electricity imported by the plant from the grid. The monthly joint meter reading report at the plant end meter records the initial & final reading of export values by the plant.
QA/QC procedures to be applied	The meters is approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years. [18] The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines will be applied appropriately to confirm the conservativeness of metering. The metering arrangement, accuracy class of meters, calibration frequency is under control of state electricity board and PP do not have any control on it. PP is getting value of net electricity supplied to grid and the same is considered the monitoring parameter.
Purpose of data	Calculation of baseline emissions
Calculation method	The monthly export for a given month is arrived as: Monthly Export = (Final Reading – Initial Reading) × Meter M.F. Similarly the import for a given month is arrived as: Monthly Import = (Final Reading – Initial Reading) × Meter M.F. Thus, Net electricity supplied to the grid by the project plant in a given month = Export, kWh– Import, kWh
Comments	Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.

4.3 Monitoring Plan

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

[18] http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the project participant. 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:



Responsibility
• Reviewing the monthly and annual generation statistics. • Evaluating the GHG performance of the project activity. • Identifying the opportunities for future improvement • Addressing grievance related to project activity.
• Implementation of corrective appropriate measures in case any discrepancies are identified in the reported parameters. • Review of monthly report. • Ensuring calibration of monitoring equipment as and when required.
• Monitoring and reporting the GHG performance related parameters following the guidance provided in the project design document • Preparation of monthly and annual generation statistics. • Reporting of any discrepancies identified in the reporting parameters. • Ensuring calibration of the monitoring equipments as and when required.

Data Measurement

The export and import energy will be measured continuously using above mentioned Main and Check meters located at the substation. Readings of meters shall be taken on monthly basis by authorized officer of SEB in the presence of PP or representative of PP. Based on the Meter Reading Statement to Rising Bhadla 1 Private Ltd and Rising Bhadla 2 Private Ltd, invoices will be raised. These invoices can be used for cross checking the meter readings taken for the respective project activity.

Data collection and archiving

Readings from meters will be collected in the presence of the plant in-charge. 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 VERs 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.

Personnel training

In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the staff 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.

5 SAFEGUARDS

5.1 No Net Harm

The project activity does not involve any major construction activity. It primarily requires the installation of the solar PV panels, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories.

However, there are no negative impacts on air, water, soil quality and ambience are envisaged due to the project activity.

5.2 Environmental Impact

The project activity has no significant impact on the environment. Solar PV projects are not included in the Schedule I of the EIA notification S.O.1533 (E) dated 14th September 2006[19] and thus an EIA is not required. Ministry of Environment & forests vide their OM J-11013/41/2006 - IA II (I) dated 13th May 2011[20] has re-affirmed this and exempted Solar PV power plants from EIA and EC requirement.

5.3 Local Stakeholder Consultation

The Local Stakeholder Meetings were organized for local stakeholder consultation and informed local stakeholder regarding the meeting. The followings are the local stakeholders for the project activity:

- Local community
- Local village administration
- Technology suppliers
- Local vendors

All the stakeholders have been invited through public notice to attend the stakeholders meeting.

The details of the Stakeholder Meetings are as follows:
Date of invitation – 15/09/2016
Date of Meeting – 24/09/2016
Location of Meeting - Project site, Rajasthan

In the introductory speech, the representative of Rising Bhadla 1 Private Ltd. and Rising Bhadla 2 Private Ltd. (Project Investor), Mr. Ayush Bhargava welcomed the gathering and given a brief about the climate mitigation project activity. Subsequent to the introductory speech, stakeholders were explained about the electricity generation from solar project is an environmental friendly power generation technology contributing to reduction in GHG emissions. They were also explained about the benefits of the solar power projects like, increasing energy availability and improving quality of power and its assistance to the local population by providing employment opportunities to both skilled & unskilled labours.

The Minutes of meeting with commenting sheet from LSH, invitation letter receipt copy shall be submitted to the DOE.

[19] http://envfor.nic.in/legis/eia/so1533.pdf
[20] http://moef.nic.in/downloads/public-information/OM-SolarPV.pdf

5.4 Public Comments

Meeting started with opening speech by representative of project participant. He introduced all guests on dais. The representative of project participant explained Technical aspects of project to stakeholders. He also explained about social, environmental & economical benefits of the project. He also elaborated about carbon mechanism & its requirement for the current project. After the detailed discussions, the session was open for questions from stakeholders.

Most of the questions are related to employment opportunities, economic development, free electricity supply, benefits from project to villagers and other development activities. The question raised by the villagers are summarised below:

Q: Does the project provides employment opportunities or improve economic development of the area?
A: Yes, the project will provide economic development of the area and will provide employment opportunities to the local people depending upon their skill and qualification.

Q: Will the operation of the plant result in increased temperature in the surroundings?
A: There will be no impact on ambient temperature due to operation of the plant.

Q: Will the project help in improving the electricity supply to the villagers or neighbourhood areas?
A: The electricity generated from the project shall be sold to NTPC under 25 year PPA who in turn shall sell it to state discom whose responsibility is to distribute electricity in their respective jurisdiction including surrounding villages. It is envisaged that this would improve the electricity availability situation in the neighbourhood area.

Q: How the project activity benefit the villages around the project site and their residents?
A: The project activity will benefit the nearby villagers by providing employment opportunities to local or nearby people and also provides immense opportunity for economic development of the area like increase in business opportunities in the form of works for module cleaning, hiring of vehicle etc., improvement in transportation; and various social activities shall help to uplift the standard of living.

All the above queries were suitably and satisfactorily replied / clarified by project participant's representatives. There were no major comments or protest raised by the stakeholders and they were totally in support for setting up of these kinds of projects in the region.

The meeting was concluded by vote of thanks to all the participants.