Gold Standard for the Global Goals
Key Project Information & Project Design Document (PDD)

Version 1.1 – August 2017

KEY PROJECT INFORMATION

Title of Project:	400 MW Solar Power Project at Bhadla, Rajasthan
Brief description of Project:	The purpose of the project activity is to generate power using renewable energy source (solar energy) and sell the power generated to the state grid. The project activity generates electricity using solar energy. The generated electricity is exported to the regional grid system which is under the purview of the INDIAN electricity grid of India. The project activity replaces anthropogenic emissions of greenhouse gases estimated to be approximately 694,471 tCO_{2e} per year, thereon displacing 732,874 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.
Expected Implemetation Date: **Expected duration of Project:**	31/05/2018 25 years
Project Developer:	SB Energy Pvt. Ltd
Project Representative:	EKI Energy Services Limited
Project Participants and any communities involved:	SB Energy Pvt. Ltd
Version of PDD: **Date of Version:**	01 02/01/2019
Host Country / Location:	India
Certification Pathway (Project Certification/Impact Statements & Products	Impact Statements & Products
Activity Requirements applied: **(mark GS4GG if none relevant)**	GS4GG
Methodologies applied:	ACM0002- Grid-connected electricity generation from renewable sources - Version 19
Product Requirements applied:	Gold Standard Verified Emission Reductions (GSVERs)
Regular/Retroactive:	Retroactive
SDG Impacts:	**1 – SDG 7 –** Affordable and Clean Energy Contribution to Climate Security & Sustainable Development **2 – SDG 8 –** Descent Work and Economic Growth **3 – SDG 13 –** Climate Action
Estimated amount of SDG Impact Certified	694,471 tCO_{2e} / annum (for SDG 13) 732,847 MWh (for SDG 7) 1 training /annum and 10 people employed (for SDG 8)

SECTION A. Description of project

A.1. Purpose and general description of project

Purpose of the Project activity

The purpose of the project activity is to generate power using renewable energy source (solar energy) and sell the power generated to the state grid. The project activity generates electricity using solar energy. The generated electricity is exported to the regional grid system which is under the purview of the INDIAN electricity grid of India.

The project activity replaces anthropogenic emissions of greenhouse gases estimated to be approximately 694,471 tCO_{2e} per year, thereon displacing 732,874 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 total installed capacity of the current project activity is 400 MW; which involves operation of Solar PV Project in the state of Rajasthan in India. The project is promoted by SB Energy Pvt Ltd.

Project Investor	Project Type	Project Capacity	Date of Commissioning	State	Usage
SB Energy One Private Limited	Solar PV	100 MW	21-09-2018	Rajasthan	Sale to State Discom
		100 MW	24-09-2018		
		100 MW	24-09-2018		
SB Energy Three Private Limited		20 MW	04-10-2018		
		20 MW	04-10-2018		
		30 MW	18-09-2018		
		30 MW	18-09-2018		

The project activity is a new facility (Greenfield) and the purpose of the project activity is to generate energy electricity by the utilization of renewable Solar energy and further selling the generated energy to the Indian Grid. In this process there is no consumption of any fossil fuel and hence the project does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

As per prior consideration guideline, the major Milestone of Project activity are as below:

1. The PP decided to implement the project activity on 01/09/2017
2. The erection and commissioning agreement for Solar project between L&T and SB Energy Once Pvt. Ltd on 15/03/2018.
3. The initial PPA is signed on 06/10/2017 between Solar Energy Corporation of India Limited and SB Energy One Private Limited.
4. The project initial documents like GS4GG PDD, Cover Letter, ODA letter and Terms and conditions are submitted to GS on 06/11/2018 for preliminary review purpose.

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.

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 carbon credit 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 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.

A.2. Eligibility of the project under Gold Standard

The project activity meets the eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements document as described below:

- The project applies methodology ACM0002, Version 19[1], Sectoral Scope: 01, which is an approved methodology under Gold Standard.
- The project type is power generation using Solar Energy which is an eligible project type as it is in accordance with 1.1.1 a) and 1.1.1 b) of the Eligible Project Types & Scope under Renewable Energy Activity Requirements. The criteria as per 1.1.1 c) and 1.1.1 d) of this requirement are not relevant to project activity , hence not applicable.
- The project activity is solar photovoltaic and not specific Renewable Energy project types like Hydropower, projects using biomass resources etc., hence as per criteria 1.1.2 additional eligibility criteria are prescribed in Annex A (Additional criteria for specific renewable energy project types) of 200-GS4GG-Renewable-Energy-Activity-Requirements-v1.1 document is not applicable for the project activity.
- As per criteria 1.1.3 of 200-GS4GG-Renewable-Energy-Activity-Requirements-v1., the project activity conforms (a) Gold Standard for the Global Goals Principles & Requirements (and associated documents) AND (b) Gold Standard Renewable Energy Activity Requirements.
- The project activity is not seeking the renewable Energy Labels, hence criteria 1.1.4 of VERs, hence 200-GS4GG-Renewable-Energy-Activity-Requirements-v1.1 document is not applicable for project activity.
- The project activity results in displacement of electricity from thermal power stations while contributing to sustainable development of India. Hence, the project contributes to the Gold Standard Vision and Mission.

[1] http://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD

- Solar power is an approved project type and does not require approval from Gold Standard.
- This project activity is not associated with geo-engineering or energy generated from fossil fuel or nuclear, fossil fuel switch, nor does it enhances or prolongs such energy generation.

General Eligibility Criteria under criteria 1.2 of Renewable Energy Activity Requirements

Project Type: As discussed above, the project type is eligible.
Project Location: The project is located in India. The project activity is not located in HCV areas. Further details have been provided in section A.4 of this report.
Project scale: The project activity is 400 MW Solar Energy project and thus qualifies under large scale projects.

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

SB Energy Pvt Ltd. is the project proponent (PP) of project activity and have the legal right to control and operate the project activities.

The project ownership has been demonstrated through below supporting documents:

1. **Commissioning certificates –** The letter from respective State Nodal Agency to SB Energy Pvt Ltd for commissioning of generation facility indicates that PP have the legal right to control and operate the project activities.

2. **Contract with EPC contractor –** The purchase order on the name of SB Energy Pvt Ltd indicates that PP have the legal right to control and operate the project activities.

Based on above evidences, the project ownership is with **SB Energy Pvt Ltd**.

A.4. Location of project

A.4.1. Host Country

India

A.4.2. Region/State/Province etc.

State: Rajasthan
District: Jodhpur

A.4.3. City/Town/Community etc.

Villages: Bhadla
Taluka: Phalodi

A.4.4. Physical/Geographical location

Project Investor	Project Capacity	Latitude (D° M′ Sec″)	Longitude (D° M′ Sec″)
SB Energy One Pvt Ltd	300	16° 38′ 12.6924″	75° 59′ 14.0072″
SB Energy Three Pvt Ltd	100	16° 36′ 12.8556″	75° 59′ 32.8664″

The location of the project activity has been highlighted in the map shown below

Both the solar plant of respective project investor are located at a single region and the details are as follows2:

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)

[2] Sourced from DPR of the project activity.

Figure 1. State and district Map of Rajasthan and Jodhpur

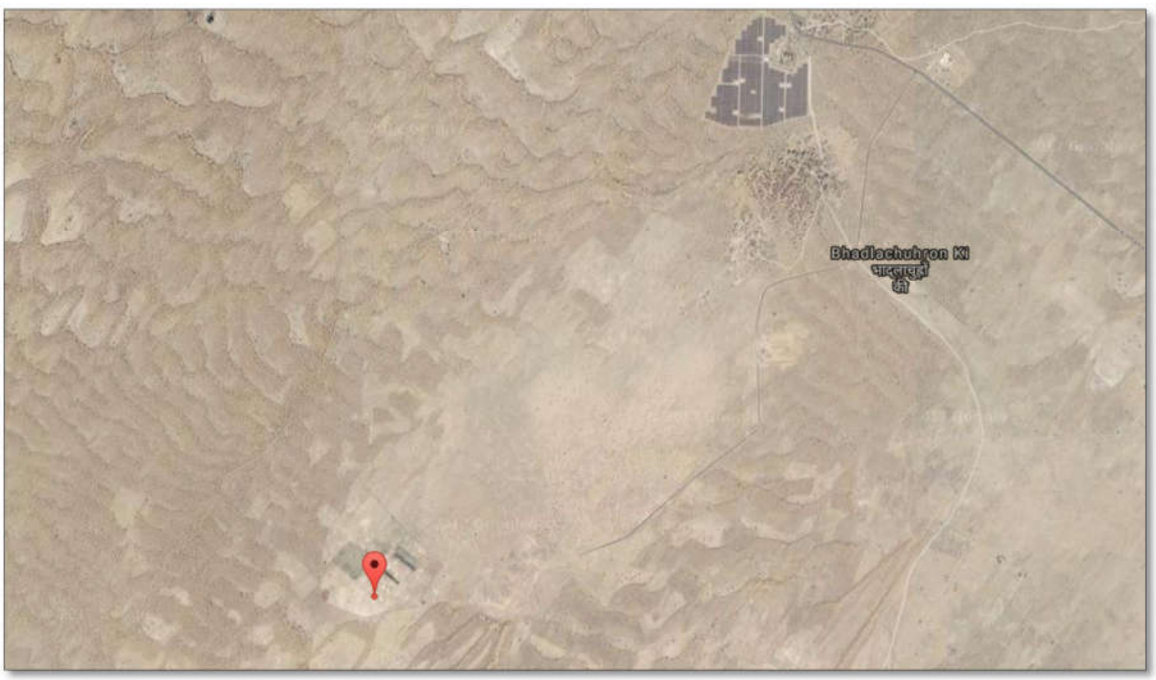


Figure 2 Pin point drop on Google maps

A.5. Technologies and/or measures

The total installed capacity of the project is 400 MW, which compises of two projects owned by SB Energy One Pvt Ltd and SB Energy Three Pvt Ltd in Rajasthan. The SOLARs used in the project activity are of INOX Solar Limited.

The technical specification of the SOLAR project are as follows:

A.6. Scale of the project

The project is a large scale project utilizing Solar PV modules to generate electricity. The total installed capacity of the project is 400 MW

A.7. Funding sources of project

There is no public funding from Annex 1 countries and no diversion of Official Development Assistance (ODA) involved in the project activity.

A.8. Assessment that project complies with 'gender sensitive' requirements

As per mandatory requirement of "Gold Standard Gender Equality Guidelines & Requirements", the " a)Foundation gender-sensitive requirements" are followed by PP.
All projects submitted for Gold Standard certification must have GENDERSENSITIVE PROCEDURES/ STRATEGIES AND MUST ADHERE TO THE GENDER PRINCIPLES AS ESTABLISHED IN THE GOLD STANDARD GENDER POLICY. STEPS 1 – 3 require all project developers to complete a gender safeguards assessment and gender-sensitive stakeholder consultations as part of initial project design and feasibility. Meeting these requirements enables projects to claim to be 'Gender-Sensitive'. This is a mandatory foundational requirement that applies to all Gold Standard certifications. This level of certification is based on adherence to process as described in Steps 1-3.
Also Steps 1-3 require four mandatory questions to be answered and the same are discussed as below.

Question 1: Does the project reflect the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy? Explain how.

Response: As per Gold Standard Gender Policy, p. 10 "Foundational gender-sensitive requirement - This strengthens Gold Standard's 'do no harm' approach and addresses safeguards to prevent or mitigate adverse impacts on women or men and girls and boys. Such action is mandatory for all projects seeking Gold Standard certification and includes compliance with the gender 'do no harm' safeguards, gender gap analysis and gender sensitive stakeholder consultations."

The project activity is a renewable energy project and does not involve any discrimination between men and women. The project does not adversely impact women or men. The PP have policies in place and they don't differentiate between women and men.

Question 2: Does the project align with existing country policies, strategies and best practices? Explain how.

Response: India is party to "Convention on the Elimination of All Forms of Discrimination against Women" and the project is aligned its labour policies which does not discriminate on gender.

Question 3: Does the project address the questions raised in the Gold Standard Safeguarding Principles & Requirements document? Explain how.

Response: The Project shall complete the following gender assessment questions below:

1. Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?

No, the Project being a Solar project does not reduce access to or control of resources for women.

2. Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?

No, the Projectbeneficiaries in terms of employment and social upliftment of the area are common for both the gender.Further the project has carried out various CSR activities leading to welfare of community at large.

3. Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?

No, the CSR activities carried our by the project proponent are discussed with the community consisting both the genders.

4. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?

Yes the project takes into account gender roles and abilities of women/men. Job profile is allocated based on the type of work to be carried out.

5. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?

No, on the contrary the project leads to increased availability of electricity in the regional grid thereby uplifiting the living standards.

6. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?

No, since the project is a renewable electiricity generation project, thus it will not have discriminated against women.

7. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?

No, in fact, the project leads to improved electricity in the regional grid thereby leading to less usage of fueil for lighting.

8. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?

No, in fact, due to improved electricity availability the usage of fuel for lighting would be reduced as well as indoor air quality would be improved.

Question 4: Does the project apply the Gold Standard Stakeholder Consultation & Engagement Procedure Requirements? Explain how.

Response: The project is currently a GS project applying for retroactive GS registration. The LSC conducted as part of the GS project involved participants including local villages, NGOs, government officials, suppliers, employees and general stakeholders. The nearby villagers are the most relevant stakeholders for this project activity and they were invited during local stakeholder consultation.

Since the project is applying retroactively for GS registration, a Stakeholder Feedback round would be carried out.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved 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 15 MW
Methodology : ACM0002: Grid-connected electricity generation from renewable sources - Version 19.0[3]
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[4] - Version 07.0 (EB 100, Annex 04)
- Methodological Tool- Tool for the demonstration and assessment of additionality[5] - Version 07.0.0 (EB 70, Annex 08)
- Methodological Tool- Investment analysis[6] - Version 07.0.0 (EB 92, Annex 05)

B.2. Applicability of methodology

The project activity is Grid connected renewable power generation and meets the applicability conditions of the chosen methodology as follows:

The project activity involves generation of grid connected electricity from renewable Solar energy. The project activity has an installed capacity of 30 MW which will qualify for a large CDM project activity under large scale methodologies. The project status is corresponding to the methodology ACM0002 version 19.0 and applicability of methodology are discussed below:

Applicability	Project activity vis-à-vis applicability Conditions
This methodology is applicable to grid-connected renewable 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.
The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, Solar power plant/unit, geothermal power	The project activity is an installation of a new grid connected renewable energy power plant and hence this condition is met.

[3] http://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD

[4] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf

[5] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

[6] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v7.0.pdf

plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	
In the case of capacity additions, retrofits, rehabilitations or replacements (except for Solar, 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 project activity does not involve any capacity additions, retrofits or replacements and therefore this condition is not applicable.
In case of hydro power plants, one of the following conditions shall apply: 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, calculated using equation (3), is greater than 4 W/m^2. 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.	The project activity is a grid connected renewable Solar energy project. This condition is applicable only for hydro power plants and not applicable for Solar projects. Therefore this condition is not applicable for project activity.

In the case of integrated hydro power projects, project participant shall: i) 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 ii) 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 activity is a grid connected renewable Solar PV energy project. This condition is applicable only for hydro power plants and not applicable Solar projects. Therefore this condition is not applicable for project activity.
Methodology is not applicable to the following: 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	The project activity is an installation of a new grid connected renewable energy project and does not involve switching from fossil fuel to renewable energy and hence this criterion is not relevant to the project activity.
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".	The project activity is a new grid connected renewable Solar energy plant and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity.

Tool to calculate the emission factor for an electricity system[7] - Version 07.0 (EB 100, Annex 04)

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

Applicability Criterion (with Para number reference)	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 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.	Steps involved in calculation of Emission Factor is included in section B.6.3 of the PDD as per the requirement of the tool
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 CO_2 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)

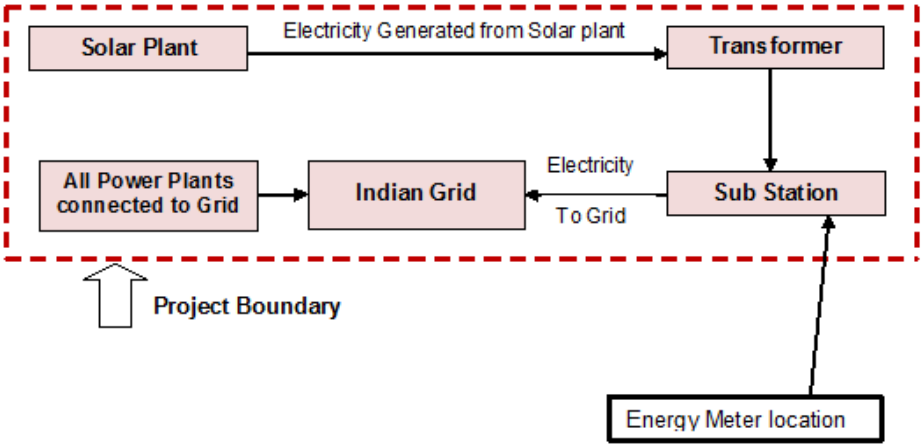
Applicability Criteria has been demonstrated in section on additionality below.

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 30 MW which is applicable as per large scale project activities methodology ACM0002: Grid-connected electricity generation from renewable sources Version 19.0. 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.

B.3. Project boundary

As per ACM0002 version 19.0 - "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 PV Plant, 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.



	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 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

B.4. Establishment and description of baseline scenario

Baseline Senario

As per the approved consolidated Methodology ACM0002 (Version 19.0) para 22: *"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 project to harness the power of Solar 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 13 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
$EF_{grid,CM,y}$	0.9475 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 13.0, June 2018 published by Central Electricity Authority (CEA), Government of India
$EF_{grid,OM,y}$	0.9726 tCO_2/MWh	Operating margin CO_2 emission factor for the project electricity system in year y	Calculated as the last 3 year (2014-15, 2015-16, 2016-17) generation-weighted average, sourced from Baseline CO_2 Emission Database, Version 13.0, June 2018 published by Central Electricity Authority (CEA), Government of India
$EF_{grid,BM,y}$	0.8723 tCO_2/MWh	Build margin CO_2 emission factor for the project electricity system in year y	Baseline CO_2 Emission Database, Version 13.0, June 2018 published by Central Electricity Authority (CEA), Government of India

Calculation of Baseline Emission

As per the approved consolidated Methodology ACM0002 (Version 19.0) para 42:

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:

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

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 CO_2 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 07 is calculated as below.

CO_2 Baseline Database for the Indian Power Sector, Version 13, June 2018[8] published by Central Electricity Authority (CEA), Government of India has been used for the calculation of emission reduction.

[8] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

As per Methodological tool: Tool to calculate the emission factor for an electricity system (Version 07.0, EB 100, Annex 4), 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 CO_2 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	**Rajasthan**
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	West Bengal	Dadar& Nagar Haveli	Meghalaya	Tamil Nadu
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Telangana
Punjab	Andaman & Nicobar	Maharashtra	Nagaland	Puducherry
Rajasthan		Goa	Tripura	Lakshadweep
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, Solar, low cost biomass, nuclear and solar generation.

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

	2012-13	2013-14	2014-15	2015-16	2016-17
India	16.9%	18.6%	16.8%	15.1%	14.6%

Data Source: Central Electricity Authority (CEA) database Version 13, June 2018[9]

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:

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

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.

[9] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

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)			
	2014-15	2015-16	2016-17
INDIAN Grid	810,011	871,753	916,278

Simple Operating Margin (tCO2/MWh) (incl. Imports)			
	2014-15	2015-16	2016-17
INDIAN Grid	0.9903	0.9655	0.9636

Weighted Generation Operating Margin	
INDIAN Grid	**0.9726**

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 07.0, EB 100, Annex 4) 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 (tCO2/MWh) (not adjusted for imports)	
	2016-17
INDIAN Grid	**0.8723**

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 07.0, EB 100, Annex 4) 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:

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

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}:

Solar 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, $\mathbf{EF_{grid,CM,y}}$ = 0.9726 * 0.75 + 0.8723 * 0.25
= **0.9475 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, $EF_y = EF_{grid,CM,y}$ = 0.9475 t CO_2/MWh.

$\mathbf{BE_y}$ = 735,840 x 0.9475

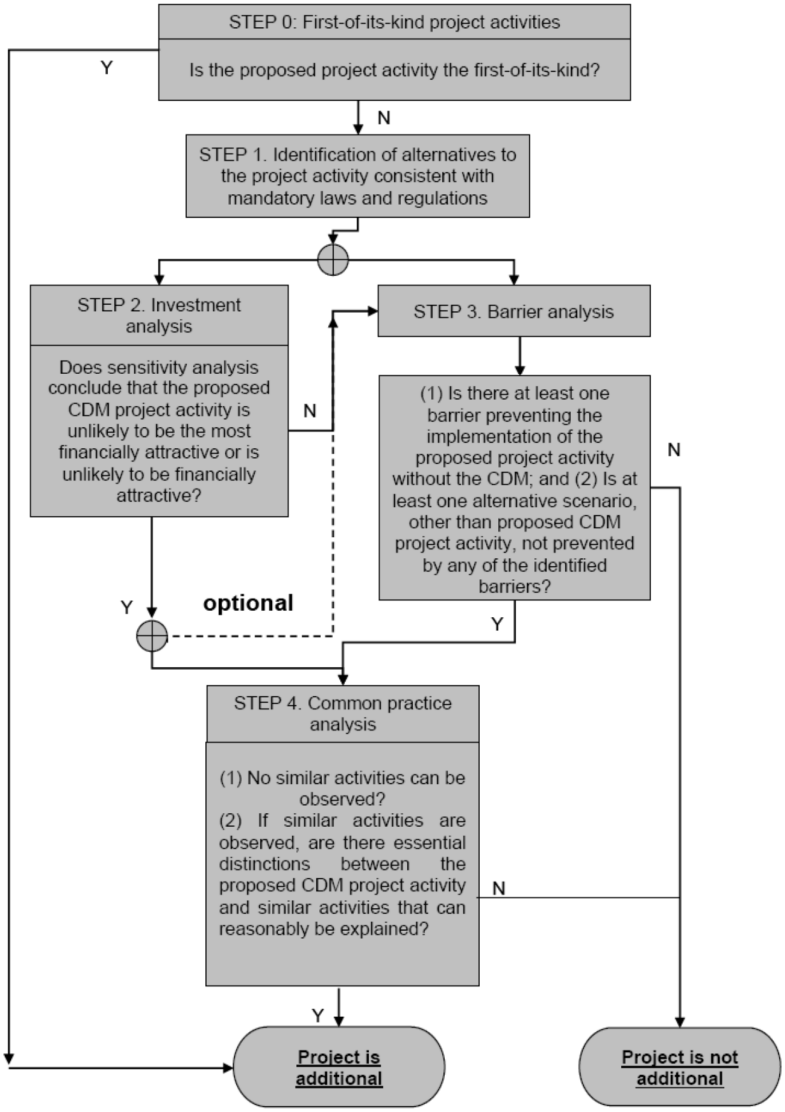
= **694,471 tCO_{2e}**

B.5. Demonstration of additionality

The table below is only applicable if the proposed project is deemed additional, as defined by the applied approved methodology or activity requirement or product requirement.

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	Not Applicable
Describe how the proposed project meets the criteria for deemed additionality.	Not Applicable

The project generates power using Solar energy which is a renewable, zero emission source of energy. Baseline considerations for the project are based on approved consolidated baseline methodology ACM0002 (Version 19.0). 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:



The additionality of the Project activity is ascertained in line with the applicable guidance from the UNFCCC. The demonstration of additionality for the proposed Project activity is being carried out in accordance with the additionality tool provided by the UNFCCC i.e. "Tool for demonstration and assessment of Additionality" Version 07.0.0,. The tool provides a step-wise approach to demonstrate additionality which is displayed below:

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 not applicable.

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

Sub-step 1a: Define alternatives to the project activity:

Identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the proposed GS project activity.

The purpose of the project activity is to generate electrical power using Solar energy and feed the electricity generated to the grid. Hence, the following alternatives are considered:

Alternative 1: The proposed project activity not undertaken as a GS project activity.

The PP could proceed with the implementation of the project without Carbon credit benefits. The electricity produced from the renewable energy project would have been sold to the grid. This is in compliance with all applicable legal and regulatory requirements and can be a part of the baseline. However, the Project activity is not feasible without revenues from sale of Carbon Credits. This argument has been discussed in step 2 of the Additionality section.

Alternative 2: No proposed project activity and equivalent amount of energy would have been produced by the grid electricity system through its currently running power plants and by new capacity addition to the grid i.e. Continuation of the present situation.

The PP would have continued without investment in Project activity with usual business activities. The grid would continue with the fossil fuel based power projects and this would result in GHG emissions. Hence, the new capacity add-on from a fossil fuel based power plant is appropriate, realistic & credible baseline alternative for the project activity.

Outcome of Sub-step 1a: All the realistic alternatives for the project activity have been enlisted above. Thus though two alternatives are mentioned above as per step of additionality tool, the first alternative is not possible as project activity is not viable without carbon credit benefits and second alternative is the baseline scenario for the project activity as per methodology as mentioned in section B.4 of GS4GG PDD.

It is to be noted that being the green field project activity, "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".

Sub-step 1b: Consistency with mandatory laws and regulations:

The alternative(s) shall be in compliance with all applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution. The project activity comes under white category as mentioned in section 1.11 of this document, thus there shall be no necessity of obtaining the Consent to Operate" for White category of industries. Since project activity falls under white category and the non-polluting nature of project fulfils the compliance to the local laws and regulations (This sub-step does not consider national and local policies that do not have legally-binding status).

The relevant national laws and regulations pertaining to generation of energy in India are:

- Electricity Act 2003
- National Electricity Policy 2005
- Tariff Policy 2006

The Project activity conforms to all the applicable laws and regulations in India:

- Power generation using renewable energy is not a legal requirement or a mandatory option.
- There are state and sectoral policies, framed primarily to encourage Solar power projects.
- These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments.
- The Indian Electricity Act, 2003 (May 2007 Amendment) does not influence the choice of fuel used for power generation.
- There is no legal requirement on the choice of a particular technology for power generation.

The both alternatives are in compliance with laws and regulations required. There is no any mandatory requirement to implement the project activity.

Outcome of Sub-step 1b: Hence, both the alternatives enlisted above are found to comply with the mandatory laws and regulations taking into account the enforcement of the legislations in the region or country and EB decisions on national and/or sectoral policies and regulations. Since Solar projects are categorised as white category, no any consent to operate required from pollution control board.

However, Alternative 2 has been selected as the appropriate baseline alternative for this project activity in line with methodology.

Step 2: Investment analysis

Determine whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified in step 1, without the revenue from the sale of emission reductions credits. To conduct the investment analysis, use the following sub-steps:

Sub-step 2a: Determine appropriate analysis method

The Project activity envisages to export the power to Indian grid and the revenues from the sale would be generated in accordance with the terms and tariffs established in the Power Purchase Agreement (PPA). Thus, simple cost analysis (Option I) cannot be used as the analysis method as the sale of the units of generated electricity shall result in a revenue stream during the operations of the Project activity.

In the absence of the project activity grid electricity would have been the obvious choice for the Project which requires no investment. Hence investment comparison analysis (Option II) is also not appropriate for the project activity.

After eliminating Option I and Option II, the use of Benchmark analysis (Option III) is the method of analysis that has been selected as the most suitable method. This method determines the attractiveness of the project activity for the investors, as well as provides a measure of the viability of the investment to generate revenues during its operation, as compared with other avenues and investment options. Hence, the Benchmark analysis method is to be employed for analysis of the said project.

Sub-step 2b (Option III): Apply benchmark analysis

The investment analysis using Benchmark analysis approach (Option III) has been chosen. Further, this method illustrates the evaluation of the Project by the PP before the decision to undertake the project was taken and management approval granted.

Choice of Financial Indicator:

According to the "Tool for demonstration and assessment of Additionality", the financial indicator can be based either on (1) project IRR or (2) equity IRR. There is no general preference between the approaches (1) or (2). The benchmark chosen for analysis shall be fully consistent with the choice of approach. Therefore in accordance with the guidance, the relevant financial indicator for project activity has been chosen as post tax equity IRR.

Choice of Benchmark:

As per Investment Analysis tool, Required/expected returns on equity are appropriate benchmarks for an equity IRR. The Equity IRR is considered as the financial indicator and the benchmarks used is cost of equity. Hence the benchmarks used are applicable to the project activity and the type of IRR calculation presented

At the time of decision made of project activity, Version 06 of methodological tool "Investment Analysis" (EB 92 Annex 5) was the latest available tool to PP, hence PP has considered the same tool for default value of return on equity. The default value of Return on Equity for Group-1 projects in India is 11.06 %.

As per paragraph 7 of Appendix A of the above mentioned document, "In situations where an investment analysis is carried out in nominal terms, project participants can convert the real term values provided in the table below to nominal values by adding the inflation rate. The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the project activity shall be used".

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 = {(1+Real Benchmark) * (1+Inflation rate)}-1

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

Benchmark estimation:

For the 400 MW Solar Project by SB Energy Pvt. Ltd

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 %

Inflation Forecast for India as per RBI website[10] :

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 project activity.

Benchmark Calculations	Value	Sources Link	Document Date	Decision making Date
Default Value for India as per UNFCCC guidelines	**11.06 %**	EB 92 Annex 5	04-11-16	27-09-17

[10] https://rbi.org.in/Scripts/PublicationsView.aspx?id=17458

Inflation forecast (WPI Mean) as per RBI for 10yrs	**4.00 %**	https://rbi.org.in/Scripts/PublicationsView.aspx?id=17458	04-06-17	
Benchmark (with 10yrs Forecast)	**15.50 %**	Calculated		

Thus benchmark of 15.50 % has been selected for this project activity.

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

The Post tax Equity IRR is evaluated for the entire lifetime of the project activity, i.e. 25 years. It is calculated based on the cash outflows from and cash inflows into the project activity.

Key Assumptions supporting financial projections are provided in excel spreadsheet to the DOE and the same has been summarized in Annex-1 of this report.

Based on result of IRR excel spreadsheets, equity IRR is less than Benchmark.

This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark). Thus it can be easily concluded that project activity is additional & is not business as usual scenario.

Sub-step 2d: Sensitivity Analysis

Addressing Guidance 28 & 29 of EB 92, Annex 5, following factors has been subjected to sensitivity analysis:

1. PLF
2. O&M Cost
3. Project Cost
4. Tariff

The rationale of sensitivity is, "The ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis."

The results of sensitivity analysis show that even with a variation of +10% & -10% in project cost, O&M cost, PLF and Tariff Rate Equity IRR is significantly lower than the benchmark. And it is evident from the results given above; the project remains additional even under the most favourable conditions.

Probability to breach the benchmark:
Sensitivity Parameter 1 : PLF
PLF considered in financials for is as per Third Party DPR in line with **"Guidelines for the reporting and validation of Plant load factors" stated in EB48 Annex11 option 3(b).** Hence, variation in PLF of more than 10% is unlikely to happen as the PLF has been reported as per the Third Party Report based on long term data.
Sensitivity Parameter 2 : O&M
The sensitivity analysis reveals that O&M will breach the benchmark at negative values and is hypothetical case. Since the O&M cost is subject to escalation (as evidence by the O&M agreement) and also subject to inflationary pressure, any reduction in the O&M costs is highly unlikely. Hence, the reduction in the O&M cost is highly unlikely.
Sensitivity Parameter 3 : Project Cost

Project Cost for financial analysis is considered from DPR of the project activity, being available at the time of investment making decision to go ahead with the project activity. The actual project cost is lower within 10% than the DPR cost. Since the Purchase Order cost is firm, there is no possibility of project cost going below this level. However, Sensitivity is carried out for threshold level below which benchmark is not breached.
Sensitivity Parameter 4 : Tariff Rate
The tariff is determined by PPA which is fixed for entire lifetime of the project activity. Hence, there is no probability to get variation for the same. However, Sensitivity is carried out for +/-10% even then the benchmark is not breached.

Outcome of Step 2:

This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark Equity IRR) for any of the investor. Thus it can be easily concluded that project activity is additional & is not business as usual scenario.

Step 3: Barrier analysis

Barrier analysis has not been used.

Step 4: Common practice analysis

For the concerned project activity, Common Practice Analysis has been carried out for 30 MW capacity Solar Project by **SB Energy Pvt. Ltd**.

Stepwise approach for common practice analysis has been carried out as per Methodological tool "Common Practice", version 03.1 EB 84, Annex 7:

Step (1): Calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.

Range	Capacity	Unit
+50%	45	MW
Capacity of the proposed project activity	30	MW
-50%	15	MW

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:

a) As the project is located in Rajasthan state of India, therefore, projects in the geographical area of Rajasthan have been chosen for analysis. The project activity involves generation of electricity from Solar energy. The project activity are located in the states of Rajasthan in India and the policy applicable for the Solar projects is regulated by respective state policy. The policies/tariff for each state is regulated by State Electricity Regulatory Commissions of respective states and they differ for respective states. The project implemented in different states are claimed as different since the policies and regulations differ in each state. 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 200 MW to 600 MW.

f) The start date of the concerned project activity is 31-March-2018. Therefore projects, which have started commercial operation before 31-March-2018, have been considered for analysis.

Numbers of Similar projects identified, which fulfil above-mentioned conditioned are
N_{Solar}= 30

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 Nall.

The 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.
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 – Since project activity is large scale project, small and micro scale projects are considered as different technology project. Based on this criteria, there are no any different technology project out of similar identified projects.

2. Investment climate on the date of the investment decision – For proposed project activity, there are no any different technology project considered out of similar identified projects.

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 $N_{all} - N_{diff}$ 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.

Thus, 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.

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

SDG Goal	Relevant SDG Target	Corresponding indicator
SDG 7 – Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable and modern energy for all	7.2- By 2030, increase substantially the share of renewable energy in the global energy mix	Electricity produced and supplied to the grid
SDG 8 – Descent Work and Economic Growth: Promote inclusive and sustainable economic growth, employment and decent work for all	8.5- By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	1. No. of trainings provided to the employees 2. Employment generated due to project activity
SDG 13 – Climate Action: Take urgent action to combat climate change and its impacts	13.2: Integrate climate change measures into national policies, strategies and planning	Emission reductions in tCO_2

B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

SDG Goal	Methodological choices/approaches for estimating the SDG outcome
SDG 7 –Affordable and Clean Energy : Ensure access to affordable, reliable, sustainable and modern energy for all	**Measurement Method:** - Electricity produced and supplied to the grid is monitored through energy meter. Net electricity will be calculated by state electricity board and O&M operator on monthly basis and provided in the share certificate/monthly report or equivalent. The other parameters used for net electricity supplied to grid are mentioned in monitoring plan. **QA/QC Process:** This parameter is monitored monthly and value of parameter will be cross checked with invoices. The meters will be calibrated on regular frequency.
SDG 8 – Descent Work and Economic Growth: Promote inclusive and sustainable economic growth, employment and decent work for all	**Measurement Method:** - Training and employment generation is monitored through training records, staff register or letter from O&M contractor for training and employment details or HSE/HR records **QA/QC Process:** This parameter is based on records, data and no any QA/QC procedure required. The DOE can confirm this parameter with interview with PP or Site incharge or employees for training and employment generation.
SDG 13 – Climate Action : Take urgent action to combat climate change and its impacts	**Measurement Method:** - The emission reduction parameter is calculated as product of net electricity supplied to grid and grid emission factor. The grid emission factor is ex-ante parameter and determined based on data obtained from "CO_2 Baseline Database for Indian Power Sector" version 07, published by the Central Electricity Authority, Ministry of Power, Government of India. This is in line with "Tool to calculate the emission factor for an electricity system, version 13.0". The emission reductions are calculated as per registered PDD and as per methodology requirement. **QA/QC Process:** This parameter is calculated, and no any QA/QC procedure required.

B.6.3. Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

a. **SDG13 : Climate Action :** The project would lead to reduction of approx 72,210 tCO_2e per annum
b. **SDG 7 : Affordable and Clean Energy :** The project is expected to generate 76,212 MWh of clean energy per annum
c. **SDG 8 : Decent Work and Economic Growth :** The project provides employment to around 10 persons.

Relevant SDG Indicator	**SDG 13: Climate Action**
Data/parameter	**$EF_{grid,OM,y}$**
Unit	tCO_2/MWh
Description	Operating Margin CO_2 emission factor in year y
Source of data	Calculated from CEA database, Version 13, June 2018[11]
Value(s) applied	0.9726
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 05" as per the latest data available for the most three recent years 2014-15, 2015-16 and 2016-17. The data is obtained from "CO_2 Baseline Database for Indian Power Sector" version 13, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Relevant SDG Indicator	**SDG 13: Climate Action**
Data/parameter	**$EF_{grid,BM,y}$**
Unit	tCO_2/MWh
Description	Build Margin CO_2 emission factor in year y
Source of data	Calculated from CEA database, Version 13, June 2018
Value(s) applied	0.8723
Choice of data or Measurement methods and procedures	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 2016-17. The data is obtained from "CO_2 Baseline Database for Indian Power Sector" version 13, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Relevant SDG Indicator	**SDG 13: Climate Action**
Data/parameter	**$EF_{grid,CM,y}$**
Unit	tCO_2/MWh
Description	Combined Margin CO_2 emission factor in year y
Source of data	Calculated from CEA database, Version 13, June 2018
Value(s) applied	0.9475

[11] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

Choice of data or Measurement methods and procedures	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
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

B.6.4. Ex ante estimation of outcomes linked to each of the three SDGs

SDG 7 : Affordable and Clean Energy and SDG 13 Climate Action:

For a given year, the emission reductions contributed by the project activity (ER_y) is calculated as follows:

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

Where:

BE_y	=	Baseline emissions in year y (t CO_2)
$EG_{PJ,y}$	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
$EF_{grid,CM,y}$	=	Combined margin CO_2 emission factor for grid connected power generation in year y

BE_y = 735,840 MWh/annum x 0.9475 t CO_2/MWh
= **694,471** t CO_{2e}/annum

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year y (t CO_{2e})
BE_y = Baseline emissions in year y (t CO_{2e})
PE_y = Project emissions in year y (t CO_{2e})

Therefore, ER_y = **694,471** – 0

= **694,471** t CO_{2e}/annum

SDG 8 : Decent Work and Economic Growth
The project leads to employment opportunities which would not have been possiblein the baseline scenario. The project provides employment to around 10 persons.
Also project activity improves the quality of employment by giving training to employee. Thus 1 training per year will be conducted by the project activity.

B.6.5. Summary of ex ante estimates of each SDG outcome

SDG 13 Climate Action

The baseline emissions are the product of electrical energy baseline $EG_{PJ,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.

Year	Baseline estimate	Project estimate	Net benefit
2018-19	697,281	0	697,281
2019-20	693,795	0	693,795
2020-21	693,778	0	693,778
2021-22	693,760	0	693,760
2022-23	693,743	0	693,743
Total	3,472,357	0	3,472,357
Total number of crediting years	5		
Annual average over the crediting period	694,471	0	694,471

SDG 7 : Affordable and Clean Energy

Year	Baseline estimate	Project estimate	Net benefit
2018-19	735,840	0	735,840
2019-20	732,161	0	732,161
2020-21	732,142	0	732,142
2021-22	732,124	0	732,124
2022-23	732,105	0	732,105
Total	3,664,372	0	3,664,372
Total number of crediting years	5		
Annual average over the crediting period	732,874	0	732,874

SDG 8 : Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possiblein the baseline scenario. The project provides employment to around 10 persons.

Also project activity improves the quality of employment by giving training to employee. Thus 1 training per year will be conducted by the project activity.

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Relevant SDG Indicator	**SDG 7 : Affordable and Clean Energy**
Data / Parameter	**$EG_{PJ,y}$**
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

Value(s) applied	732,874 (estimated)
Measurement methods and procedures	Thus, Net electricity supplied to the grid by the project plant in a given month = Export, kWh – Import, kWh Common metering at the substation: All the plants (including the project activity solar plant and other investors solar plant) are connected to a Pooling substation 132/220 KV GSS II and further electricity is transferred to 220/400 KV RRVPNL substation. The common metering point at RRVPNL substation consists of both main & check meters (ABT Meters) having accuracy class of 0.2s. The export/import losses between these two substations are apportioned based on pooling substation readings. The difference of final apportioned value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value will be considered for ER calculations.
Monitoring frequency	Continuous measurement & monthly recording
QA/QC procedures	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[12]. 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. The billing is raised based on substation meters.
Purpose of data	To Monitor the SDG 7 Indicator
Additional comment	Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of GS-VERs for this project activity, whichever occurs later.

Relevant SDG Indicator	**SDG13 : Climate Action**
Data / Parameter	**ER_y**
Unit	tCO_{2e}/year
Description	Emission reductions achieved per year
Source of data	As per Esitimated ER sheet. During the verification, the results shall be obtained from the Actual ER sheet.
Value(s) applied	694,471 (estimated)
Measurement methods and procedures	The baseline emissions are the product of electrical energy baseline $EG_{PJ,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.
Monitoring frequency	As per monitoring period
QA/QC procedures	Not Applicable
Purpose of data	To Monitor the SDG 13 Indicator

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

Additional comment	Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of GS-VERs for this project activity, whichever occurs later

Relevant SDG Indicator	**SDG 8 : Decent Work and Economic Growth**
Data / Parameter	**Number of employment generation**
Unit	Number
Description	Number of people employed directly due to the project activity
Source of data	Plant records or The training records for all the employees/Letter from O&M contractor for employment generation/ DOE interview with employees, local stakeholders etc
Value(s) applied	10
Measurement methods and procedures	The total number of persons working in the plant would be calculated based on the daily log available at site. This parameter also monitor number of men/women employed by the project activity. The project activity ensures that "equal pay for work of equal value" for both men and women and there is no any discrimination against women. "The employment covers number of men and number of women employed by the project activity. The job is of type temporary/permanent or skilled/unskilled, local/ non-local etc. Also it is ensued that peoples will get equal payment for equal work. The payment will be based on work and no any gender inequality for payment for work of equal value".
Monitoring frequency	Monthly monitoring and annual compilation
QA/QC procedures	The number of persons employed would be mentioned in the plant register, which can be crossed checked with attendance register.
Purpose of data	To Monitor the SDG 8 Indicator
Additional comment	-

Relevant SDG Indicator	**SDG 8 : Decent Work and Economic Growth**
Data / Parameter	**Quality of Employment**
Unit	-
Description	Training of Staff
Source of data	Plant records or The training records for all the employees/Letter from O&M contractor for employment generation/ DOE interview with employees, local stakeholders etc
Value(s) applied	1 training per year
Measurement methods and procedures	Together with the technology supplier, the Project organise training for the staff on the technology and the monitoring of the plant operation, and the emergency and safety procedures.
Monitoring frequency	Annual
QA/QC procedures	The training records for all the employees
Purpose of data	To Monitor the SDG 8 Indicator
Additional comment	-

B.7.2. Sampling plan

No sampling is required

B.7.3. Other elements of monitoring plan

Aim of monitoring:

The monitoring methodology specified in the methodology requires that the project-monitoring plan to consist of monitoring of quantity of net electricity supplied to the grid in the year y. In order to monitor the mitigation of GHG due to the project activity, the total energy exported needs to be measured. The net energy supplied to grid by the project activity multiplied by emission factor for regional grid, would form the baseline for the project activity.

Since the baseline emission factor is based on an ex-ante determination, monitoring of this parameter is not required. The sole parameter for monitoring is the net electricity exported to the grid.

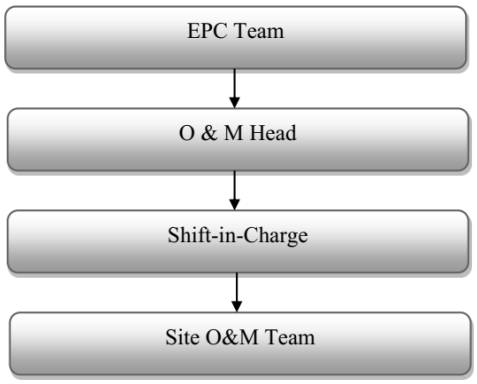
Monitoring roles and responsibilities

The operational and management structure implemented for data monitoring is as follows:

The monitoring plan is developed in accordance with the modalities and procedures for project activities and is proposed for grid-connected Solar power project being implemented within India territory. The monitoring plan, which will be implemented by the project proponent 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 monitoring, measurement, reporting and reviewing of the data rests with the project proponent. 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:



Responsibilities of O & M Head: Overall functioning and maintenance of the project activity and overall responsibility of compliance with the Monitoring Plan.

Responsibilities of Plant In-charge: Responsibility for Maintains the data records, ensures completeness of data, and reliability of data. Regularly verifying the monthly energy generation date with energy sales receipt or installed meters reading for identification of any discrepancies in data collection and taking suitable action to rectify them.

Responsibilities of Shift In-charge: Responsibility for day to day data collection and maintains day to day log book for monitored data. Responsibility for monthly and annual report generation.
Quality assurance of the data/reports and preliminary check of data for any discrepancies.

QA/QC procedures:

The energy meters at the feeders are maintained and owned by state electricity board. Neither the project proponent nor the site personnel have any control over it. The records will be cross-checked with the records of sold electricity to state electricity board. The meters are calibrated by state electricity board at-least once in five years.

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 electricity board 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 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 state electricity board officer and PP do not have any control on it. Also accuracy class of meters and calibration frequency is under purview of state electricity board officer and PP do not have any control on it. PP got the monthly credit report from where net electricity supplied to grid is obtained and used for emission reduction calculations.

Apportioning:

In case of common metering arrangement, the apportioning will be done by state electricity board and PP is getting break up sheet where the energy supplied by project activity to grid is mentioned.

The same break up sheet will be used for invoice purpose. This apportioning process is under control of state electricity board and PP do not have any control on it.

Data Archiving:

Monthly data shall be archived electronically and in paper form and stored for the entire crediting period and two years thereafter.

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.

Training and maintenance requirements:

Each and every site personnel is provided with proper training to meet the requirements of the Operations and maintenance. This ultimately leads to creativity in problem solving.

Personnel training:

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

SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

12/03/2018. This date corresponds to the date of supply agreement for Solar PV Project.

C.1.2. Expected operational lifetime of project

25 Years 00 Months

C.2. Crediting period of project

C.2.1. Start date of crediting period

31/03/2018

C.2.2. Total length of crediting period

5 Years 00 Months (First crediting period) .

5 years Renewable cycle is adopted for project activity.

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
3.0 Social & Economic Safeguarding Principles and Requirements 3.1 Principle 1 – Human Rights	1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in	No	The Project is not in conflict with the economic livelihood of the local community. The Project does not cause any human rights abuse and respects internationally	Not Applicable

	the Universal Declaration of Human Rights. 2. The Project shall not discriminate with regards to participation and inclusion.		proclaimed human rights issue. Further, the Project meets the Indian labor law requirements thus does not cause any human rights abuse. The India has ratified the United Nations Human Rights Rules and regulations. The India ratified the same as per web link[13] given below The project adheres to the host country's commitment to: Universal Declaration of Human Rights (UDHR) International Covenant on Economic, Social and Cultural Rights, India Accession 10/04/79[14] International Covenant on Civil and Political Rights India Accession 10.04.79[15] The project does not involve any conflict with livelihood of local people and respect all human rights. Stakeholder consultation had been carried out to take their opinion. The host country prohibits discrimination on the basis of a person's race, sex, religion, place of birth, or social status.	
3.2 Gender Equality and Women's Rights	1. The Project shall complete the following gender assessment questions in order to inform Requirements 2-4, below:	No		Not Applicable

[13] http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN

[14] http://hrlibrary.umn.edu/research/ratification-india.html and http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN

[15] http://hrlibrary.umn.edu/research/ratification-india.html and http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN

	• Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?		There a no possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits.	
	• Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?		There is no any possibility that the Project can adversely affect men and women in marginalised or vulnerable communities.	
	• Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?		Project does not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities.	
	• Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?		Project does not take into account gender roles and the abilities of women or men to benefit from the Project's activities	
	• Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?		The Project design does not contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities	
	• Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance,		Project does not potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full	

	regarding their full participation in design and implementation or access to opportunities and benefits? • Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services? • Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards? 2. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women. Specifically, this shall include (not exhaustive): • Sexual harassment and/or any forms of violence against women – address the multiple risks of gender-based violence, including sexual exploitation or human trafficking. •Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. • Restriction of women's rights or access to resources (natural or economic). • Recognise women's ownership rights regardless of marital status – adopt project measures where possible to support to		participation in design and implementation or access to opportunities and benefits. The Project does not potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services There is no any likelihood that the proposed Project would expose women and girls to further risks or hazards The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women. For project, every employee is treated with respect and afforded equitable treatment. The grievance register has maintained at site to take stakeholder feedback. There is no any sexual harassment and/or any forms of violence against women. The project does not involve any slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. The project does not restrict of women's rights or access to resources.	

	women's access to inherit and own land, homes, and other assets or natural resources. 3. Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work, specifically: • Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities. • Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status. • Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits. 4. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks.		The project Recognise women's ownership rights regardless of marital status Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work. The project has equal opportunuity for both men and women. The project has HR policy and same is followed equally. The project ensures participation of both men and women and they are benefitted based on pregnancy, maternity/paternity leave, or marital status. There is no limit to the access of women or men to Project participation and benefits. India ratified the International Convention on the Elimination of All Forms of Racial Discrimination[16] on 03/12/1968 with certain reservation. The project activity is in line with strategy of elimination of discrimination.	

[16] http://nhrc.nic.in/documents/india_ratification_status.pdf

3.3 Principle 3 – Community Health, Safety and Working Conditions	The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community.	No	The project is renewable energy technology and does not have exposure to increased health risks and shall not adversely affect the health of the workers and the community. Necessary health and safety measures will be taken during construction and operation phase, relevant staff will be trained to be able to work with safety. The project is in compliance with all relevant local and national laws.	Not Applicable
3.4 Principle 4 – Cultural Heritage, Indigenous Peoples, Displacement and Resettlement 3.4.1 Sites of Cultural and Historical Heritage	Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations, or practices)?	No	No cultural heritage is observed on the project site, thus no harm observed. Compliance with India's commitment to International Covenant on Economic, Social and Cultural Rights 10.04.79 will ensure no damage to critical cultural heritage. As per the list of cultural heritage sites in India [17] by UNESCO, it is clear that the project site is not a cultural heritage site	Not Applicable
3.4.2 Forced Eviction and Displacement	Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	The project has received the necessary approvals from the local authorities and does not lead to any resettlement. India (the Ministry of Rural development have the "The National Rehabilitation and Resettlement Policy, 2007[18]	Not Applicable
3.4.3 Land Tenure and Other Rights	1. Does the Project require any change to land tenure arrangements and/or other rights? 2. For Projects involving land-use tenure, are	No	No Expropriation has been conducted on any private land involved in project activity. Land has been utlised by PP directly from the owner of the land through direct negotiation of commercial terms. There has	Not Applicable

[17] http://whc.unesco.org/en/statesparties/in

[18] http://www.dolr.nic.in/nrrp2007.pdf

	there any uncertainties with regards land tenure, access rights, usage rights or land ownership? Examples include, but are not limited to water access rights, community-based property rights and customary rights.		not been involvement of any government agency in the acquiring the land. The land is acquired on mutual consent between private land owner and PP, thus there are no any issues of dissatisfaction of private land owner. The Project Developer hold uncontested land title for the entire Project Boundary to complete Project Design Certification. The land rights are with project developers.	
3.4.4 Indigenous Peoples	Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples	No	The project is located at site where there are no any peoples residing. The project is located at barren land.	Not applicable
3.5 Principle 5 – Corruption	(a) Does not recognise Projects that engage in, contribute to or reinforce corruption of any kind. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	The project is renewable energy technology and does not contribute to or reinforce corruption of any kind. Indulgence in corruption is an illegal activity in the host country and the local labor compliance takes into account of the same. The project abides by the United Nations Convention Against Corruption. India ratification [19] is made on 09.05.11	Not Applicable
3.6 Principle 6 – Economic Impacts 3.6.1 Labour Rights	1. The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the	No	Forced labor is an illegal activity in the host country and the local labor compliance takes into account of the same. Further, India is a party to ILO and forced labour is illegal in India. The india have laws in place prohibiting forced and compulsory labor[20]	Not Applicable

[19] http://www.unodc.org/unodc/en/treaties/CAC/signatories.html

[20] http://labour.nic.in/content/

	International Labour Organization (ILO) fundamental conventions. Where these are contradictory and a breach of one or other cannot be avoided, then guidance shall be sought from Gold Standard. 2.Workers shall be able to establish and join labour organisations. 3. Working agreements with all individual workers shall be documented and implemented. These shall at minimum comprise: (a) Working hours (must not exceed 48 hours per week on a regular basis), AND (b) Duties and tasks, AND (c) Remuneration (must include provision for payment of overtime), AND (d) Modalities on health insurance, AND (e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND (f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. The Project Developer shall justify that the employment model applied is locally and culturally appropriate.		The project respects fundamental right of employee. There is law in India since 1926 by The Trade Unions Act, 1926 [21] which protects rights of industrial trade unions and their members. The agreements are in place for permanent employees The project prefers the local employment and culture is maintained at project site.	

[21] http://ncw.nic.in/acts/TheTradeUnionsAct1926.pdf

	5. Child labour, as defined by the ILO Minimum Age Convention is not allowed. The Project Developer shall use adequate and verifiable mechanisms for age verification in recruitment procedures. Exceptions are children for work on their families' property as long as: (a) Their compulsory schooling (minimum of 6 schooling years) is not hindered, AND (b) The tasks they perform do not harm their physical and mental development, AND (c) The opinions and recommendations of an Expert Stakeholder shall be sought and demonstrated as being included in the Project design. 6. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.		The country have strict prohibition for child labour[22]. Thus project does not involve child labour during construction and operation of project activity. The project follows the health , safety and environment guidelines at project site. The project ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.	
3.6.2 Negative Economic Consequences	Is project involves Negative Economic Consequences 1. The Project Developer shall demonstrate the financial sustainability of the Projects implemented, also	No	No potential risks to the local economy. The financial sustainability of the Projects implemented, also including those that will occur beyond the Project Certification period.	Not Applicable

[22] http://www.indianchild.com/child_labour_law_in_india.htm

	including those that will occur beyond the Project Certification period. 2. The Projects shall consider economic impacts and demonstrate a consideration of potential risks to the local economy and how these have been taken into account in Project design, implementation, operation and after the Project. Particular focus shall be given to vulnerable and marginalised social groups in targeted communities and that benefits are socially-inclusive and sustainable.		The financial sustainability is demonstrated in registered PDD and these calculations are for entire lifetime of project activity. The project does not involve any negative impacts and no any potential risk to local economy.	
4.1.1 Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The project is renewable energy technology and does not lead any increase in greenhouse gas emissions over the Baseline Scenario.	Not Applicable
4.1.2 Energy Supply	Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The project activity supplies energy to national grid and project activity displaces equivalent quantity of electricity which would have been generayed by fossil fuel dominated grid connected power plants.	Not Applicable
4.2.1 Impact on natural water patterns and flow	Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	The project is renewable energy technology and does not affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s).	Not Applicable
4.2.2 Erosion and/or water body stability	1. Could the Project directly or indirectly cause additional erosion and/or water body	No	The project is renewable energy technology and does not affect Erosion and/or water body stability.	Not Applicable

	instability or disrupt the natural pattern of erosion? If 'Yes' or 'Potentially' proceed to question 2. 2. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?			
4.3.1 Landscapte modification and soil	Does the Project involve the use of land and soil for production of crops or other products?	No	The project proponent has implemented Environment Health Safety and Social guideline which takes into account the same. The project activity involves barren land and does not involve use of land and soil for production of crops or other products.	Not Applicable
4.3.2 Vulnerability to Natural Disaster	Will the Project be susceptible to or lead to increased vulnerability to Solar, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	The project is renewable energy technology. Thus this section is Not Applicable.	Not Applicable
4.3.3 Genetic Resources	Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?	No	The project is renewable energy technology. Thus this section is Not Applicable	Not Applicable
4.3.4 Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	No	The project has received environmental clearance from the State Pollution control Board. Further the EHSS guidelines takes into account the same. The project does not lead to release of any hazardous substances that pose threat to the environment. Rather it aims at reducing the air pollution that is prevalent due to use of fossil fuel power plants. The project promotes	Not Applicable

			environmental protection through the use of cleaner technology. The project abidesby the stipulations of the Indian Environment Protection Act 1986[23].	
4.3.5 Hazardous and Non-hazardous Waste	Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	The project is renewable energy technology. The project does not involve generation of Hazardous and Non-hazardous Waste. Standard procedure is followed at site during operation and maintenance.	Not Applicable
4.3.6 Pesticides and fertilizers	Will the Project involve the application of pesticides and/or fertilisers?	No	The project is renewable energy technology. Thus this principle is Not Applicable.	Not Applicable
4.3.7 Harvesting of forests	Will the Project involve the harvesting of forests?	No	The project is renewable energy technology. Thus this principle is Not Applicable.	Not Applicable
4.3.8 Food	Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	The project is renewable energy technology. Thus this principle is Not Applicable	Not Applicable
4.3.9 Animal Husbandry	Will the Project involve animal husbandry?	No	The Project does not involve animal husbandry. Thus Not Applicable	Not Applicable
4.3.10 High Conservation Value Areas and Critical Habitats	Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	The Project does not affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified.	Not Applicable
4.3.11 Endangered Species	1. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? 2. Does the Project potentially impact other	No	1. There are no endangered species identified as potentially being present within the Project boundary. 2. The Project does not impact other areas where	Not Applicable

[23] http://envfor.nic.in/legis/env/env1.html

	areas where endangered species may be present through transboundary affects?		endangered species may be present through transboundary affects.	

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

The details of the Stakeholder Meetings are as follows:

For 400 MW Solar Project at Rajasthan by SB Energy Pvt Ltd

Date of invitation – 30/01/2018
Date of Meeting – 07/02/2018
Location of Meeting - Project site, Rajasthan

In the introductory speech, the representative of SB Energy Pvt. Ltd (Project Investor), 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 are to be submitted to the DOE during validation.

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.

E.2. Summary of comments received

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

Q: Will the project provide 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: 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, improvement in transportation; and various social activities shall help to uplift the standard of living.

E.3. Report on consideration of comments received

No negative comments have been received on project activity from any of the local stakeholders consulted. As all comments were very positive about the project, no further action is required.

There were no further comments raised by the stakeholders and they were totally in support for setting up of these kinds of projects in the region. The local stakeholders expressed their support to the project. The meeting was concluded by vote of thanks to all the participants.

Also the stakeholder feedback round will be initiated after the listing of the project activity at GS4GG.

Appendix 1. Contact information of project participants

Organization name	SB Energy Pvt. Ltd
Registration number with relevant authority	-
Street/P.O. Box	5th Floor, Aerocity, NH 8
Building	Worldmark II
City	New Delhi
State/Region	New Delhi
Postcode	110037
Country	India
Telephone	+91 11 49217999
Fax	+91 11 49217999
E-mail	npsingh@sbenergy.com
Website	
Contact person	Mr. N.P.Singh
Title	General Manager-Assurance & Taxation
Salutation	Mr.
Last name	Singh
Middle name	-
First name	N.P.
Department	-
Mobile	-
Direct fax	-
Direct tel.	-
Personal e-mail	nosingh@sbenergy.com

Appendix 2. Summary of post registration design changes

Not Applicable

Revision History

Version	Date	Remarks
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1	10 July 2017	Initial adoption