

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



**Version 1.1 – August 2017**

## KEY PROJECT INFORMATION

<b>Title of Project:</b>	400 MW Solar Power Project at Bhadla, Rajasthan
<b>Brief description of Project:</b>	<p>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.</p> <p>The project activity replaces anthropogenic emissions of greenhouse gases estimated to be approximately 779,933 tCO<sub>2e</sub> per year, thereon displacing 832,550 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.</p>
<b>Expected Implementation Date:</b>	31/08/2018
<b>Expected duration of Project:</b>	25 years
<b>Project Developer:</b>	SB Energy Pvt. Ltd
<b>Project Representative:</b>	EKI Energy Services Limited
<b>Project Participants and any communities involved:</b>	SB Energy Pvt. Ltd
<b>Version of PDD:</b>	07
<b>Date of Version:</b>	27/03/2020
<b>Host Country / Location:</b>	India
<b>Certification Pathway (Project Certification/Impact Statements &amp; Products)</b>	Impact Statements & Products
<b>Activity Requirements applied: (mark GS<sub>4</sub>GG if none relevant)</b>	GS <sub>4</sub> GG
<b>Methodologies applied:</b>	ACM0002- Grid-connected electricity generation from renewable sources - Version 20
<b>Product Requirements applied:</b>	Gold Standard Verified Emission Reductions (GSVERs)
<b>Regular/Retroactive:</b>	Retroactive
<b>SDG Impacts:</b>	<p><b>1 – SDG 7 – Affordable and Clean Energy</b> Contribution to Climate Security &amp; Sustainable Development</p> <p><b>2 – SDG 8 – Decent Work and Economic Growth</b></p> <p><b>3 – SDG 13 – Climate Action</b></p>
<b>Estimated amount of SDG Impact Certified</b>	<p>779,933 tCO<sub>2e</sub> / annum (for SDG 13)</p> <p>832,550 MWh (for SDG 7)</p> <p>1 training /annum and 10 people employed (for SDG 8)</p>

## 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 779,933 tCO<sub>2e</sub> per year, thereon displacing 832,550 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 Mahindra Susten Private Limited and SB Energy One Pvt. Ltd on 12/03/2018.
3. The erection and commissioning agreement for Solar project between Sterling & Wilson Private Limited and SB Energy Three Pvt. Ltd on 12/03/2018.
4. The initial PPA is signed on 06/10/2017 between Solar Energy Corporation of India Limited and SB Energy One Private Limited.
5. Construction work started on 30/03/2018
6. The initial PPA is signed on 06/10/2017 between Solar Energy Corporation of India Limited and SB Energy Three Private Limited.
7. Commissioning of project activity completed in between 18/09/2018 to 04/10/2018.
8. Publication of VCS PD for Global Stakeholder Consultation- 21/09/2018<sup>1</sup>
9. Public commenting period from 24/09/2018 to 24/10/2018

<sup>1</sup> <https://registry.verra.org/app/projectDetail/VCS/1805>

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10. 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.
11. Listing of GS4GG PDD on Sustain-cert done on 08/01/2019
12. Final Validation and Verification Report submission to VCS on 05/03/2019. Monitoring period from 27/02/2017 to 31/12/2018.

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 SO<sub>x</sub>, NO<sub>x</sub>, 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 20<sup>2</sup>, 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

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<sup>2</sup> <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

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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.
- 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

## A.4.4. Physical/Geographical location

Project Investor	Project Capacity	Date of Commissioning	Latitude	Longitude
SB Energy One Private Limited	100 MW	21-09-2018	27°29'04.49" N	71°58'54.09" E
	100 MW	24-09-2018	27°29'29.04" N	71°59'15.89" E
	100 MW	24-09-2018	27°28'10.08" N	72°00'02.97" E
SB Energy Three Private Limited	20 MW	04-10-2018	27°32'08.45" N	71°57'19.10" E
	20 MW	04-10-2018	27°32'25.47" N	71°57'24.23" E
	30 MW	18-09-2018	27°31'55.48" N	71°57'58.23" E
	30 MW	18-09-2018	27°32'21.8" N	71°57'47.54" E

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 follows<sup>3</sup>:

Location of the Plant	Village - Bhadla, Tehsil - Phalodi, District- Jodhpur, State-Rajasthan
Location details	Latitude: 27°10'38.06" N Longitude: 71°55'49.16" 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 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)

<sup>3</sup> Sourced from DPR of the project activity.

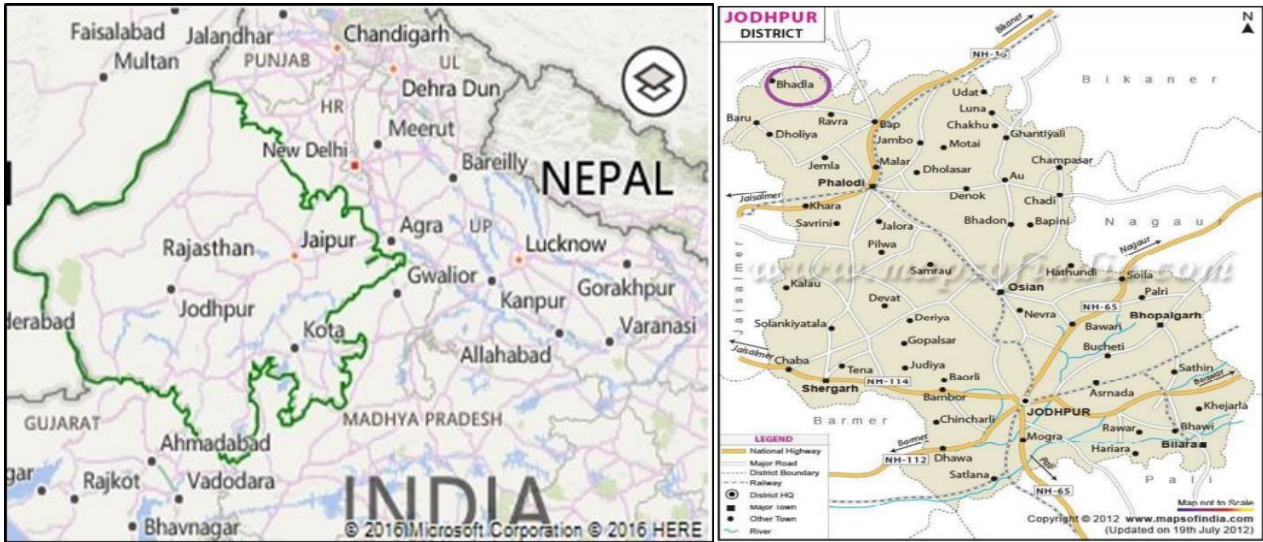


Figure 1. State and district Map of Rajasthan and Jodhpur



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 comprises of two projects owned by SB Energy One Pvt Ltd and SB Energy Three Pvt Ltd in Rajasthan.

Technical specifications of 300 MW Solar PV Project by SB Energy One Pvt. Ltd are as follows:

Sr. No.	Particulars	Details
1.	Capacity of the Project	100 * 3 MW
2.	Technology used	Polycrystalline
3.	Rating of Solar Modules	325 to 330 Wp

4.	Angle from horizontal at which the array is installed	20°
5.	Number of modules of each type	325 Wp- 2,64,840 Nos 330 Wp- 1,78,650 Nos
6.	Source of modules installed of each type	Jinergy solar in type
7.	Number of invertors installed	32 numbers
8.	Rating of invertors	3.125 MVA
9.	Date of installation of full capacity	19-09-2018
10.	PV Arrays	100 %
11.	Invertors	100 %
12.	Transformers	100%

Technical specifications of 100 MW Solar PV Project by SB Energy Three Pvt. Ltd are as follows:

Sr. No.	Particulars	Details
1.	Capacity of the Project	50 * 2 MW
2.	Technology used	Polycrystalline
3.	Rating of Solar Modules	325 to 330 Wp
4.	Angle from horizontal at which the array is installed	20°
5.	Number of modules of each type	325 Wp- 34,920 Nos 330 Wp- 60,250 Nos
6.	Source of modules installed of each type	Jinergy solar in type
7.	Number of invertors installed	16 numbers
8.	Rating of invertors	3.125 MVA
9.	Date of installation of full capacity	04-10-2018
10.	PV Arrays	100 %
11.	Invertors	100 %
12.	Transformers	100%

## A.6. Scale of the project

As per para 3.1.3 of GS4GG "Renewable Energy Activity Requirements" V 1.2, the project above microscale threshold are considered as Non microscale project.

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The project falls under the category of Non-microscale project utilizing Solar PV modules to generate electricity, with an installed capacity of 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 GENDER SENSITIVE 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 (Code of Conduct) 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)?

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No, the Project beneficiaries 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 out 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, the work timings are same for both men & women, in fact women get flexible timing in case of emergency along with added benefits such as maternity leave. Hence the project doesn't contribute to women's overload that prevents them from engaging in other activities.

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 electricity 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 provides a better platform to protect natural resources as this a renewable power project.

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. The proposed project is completely safe in terms of work environment hence there are no risks or hazards.

**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.

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Since the project is applying retroactively for GS registration, a Stakeholder Feedback round has been 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 20.0<sup>4</sup>  
**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<sup>5</sup> - Version 07.0 (EB 100, Annex 04)
- Methodological Tool- Tool for the demonstration and assessment of additionality<sup>6</sup> - Version 07.0.0 (EB 70, Annex 08)
- Methodological Tool- Investment analysis<sup>7</sup> - Version 09.0.0 (EB 101, Annex 11)

### 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 400 MW which will qualify for a large GS project activity under large scale methodologies. The project status is corresponding to the methodology ACM0002 version 20.0 and applicability of methodology are discussed below:

Applicability	Project activity vis-à-vis applicability Conditions
<p>This methodology is applicable to grid-connected renewable power generation project activities that:</p> <ol style="list-style-type: none"> <li>install a Greenfield power plant;</li> <li>involve a capacity addition to (an) existing plant(s);</li> <li>involve a retrofit of (an) existing operating plants/units;</li> <li>involve a rehabilitation of (an) existing plant(s)/unit(s) or</li> <li>Involve a replacement of (an) existing plant(s)/unit(s).</li> </ol>	<p>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.</p>

<sup>4</sup> <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

<sup>5</sup> <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

<sup>6</sup> <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

<sup>7</sup> <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v9.0.pdf>

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<p>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 plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;</p>	<p>The project activity is an installation of a new grid connected renewable energy power plant and hence this condition is met.</p>
<p>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;</p>	<p>The project activity does not involve any capacity additions, retrofits or replacements and therefore this condition is not applicable.</p>
<p>In case of hydro power plants, one of the following conditions shall apply:</p> <ol style="list-style-type: none"> <li>a. The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or</li> <li>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 <math>4 \text{ W/m}^2</math>; or</li> <li>c. The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than <math>4 \text{ W/m}^2</math>.</li> <li>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 <math>4 \text{ W/m}^2</math>, all of the following conditions shall apply:             <ol style="list-style-type: none"> <li>i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than <math>4 \text{ W/m}^2</math>;</li> <li>ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity;</li> <li>iii) Installed capacity of the power plant(s) with power density lower than or equal to <math>4 \text{ W/m}^2</math> shall be;                 <ol style="list-style-type: none"> <li>a. Lower than or equal to 15 MW; and</li> </ol> </li> </ol> </li> </ol>	<p>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.</p>

<p>b. Less than 10 per cent of the total installed capacity of integrated hydro power project.</p>	
<p>In the case of integrated hydro power projects, project participant shall:</p> <ul style="list-style-type: none"> <li>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</li> <li>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.</li> </ul>	<p>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.</p> <p>Therefore this condition is not applicable for project activity.</p>
<p>Methodology is not applicable to the following:</p> <ul style="list-style-type: none"> <li>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;</li> <li>b. Biomass fired power plants/units</li> </ul>	<p>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.</p>
<p>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”.</p>	<p>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.</p>

Tool to calculate the emission factor for an electricity system<sup>8</sup> - Version 07.0 (EB 100, Annex 04)

<sup>8</sup> <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

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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 <sub>2</sub> 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 adtionality- Version 07.0.0 (EB 70, Annex o8)

Applicability Criteria has been demonstrated in section on additionality below.

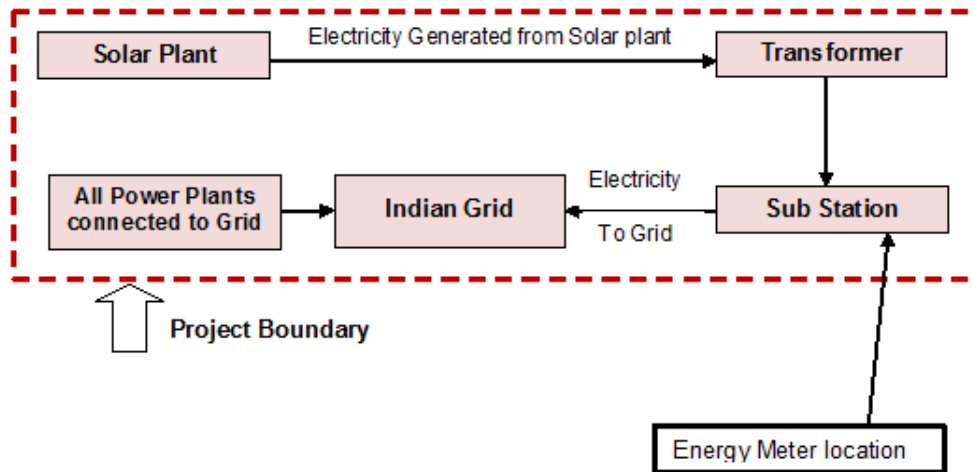
The project activity qualifies as Type I during every year of the crediting period in accordance with applicable provisions for project activity eligibility as discussed above. Also the total installed capacity of project activity is 400 MW which is applicable as per large scale project activities methodology ACM0002: Grid-connected electricity generation from renewable sources Version 20.0. 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 20.0 - "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the 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 GS4GG project activity.

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Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected electricity generation.	CO <sub>2</sub>	Yes	Main emission source
		CH <sub>4</sub>	No	Minor emission source
		N <sub>2</sub> O	No	Minor emission source
		Other	No	No other emissions are emitted from the project
Project	Greenfield Solar Power Project Activity.	CO <sub>2</sub>	No	No CO <sub>2</sub> emissions are emitted from the project
		CH <sub>4</sub>	No	Project activity does not emit CH <sub>4</sub>
		N <sub>2</sub> O	No	Project activity does not emit N <sub>2</sub> O
		Other	No	Project activity does not emit other forms of GHG emissions

## B.4. Establishment and description of baseline scenario

### Baseline Scenario

As per the approved consolidated Methodology ACM0002 (Version 20) 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.

Annexure 3 of the EB 22 states that national and/or sectoral policies and circumstances have to be accounted for when considering the baseline scenario.

Para 7(a) of the same states that, only those national and/or sectoral policies or regulations under paragraph 6(a) i.e. type E+ policy that increase GHG emissions, that have been implemented before adoption of the Kyoto Protocol by the COP (decision 1/CP.3, 11 December 1997), shall be taken into account when

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developing a baseline scenario. The Electricity Act of 2003 promoted cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity (Refer Section 86(1) of Electricity Act 2003). Therefore, it could be seen that the provincial and sectoral policies are E- i.e., policies that decrease GHG emissions and are after November 2001. Hence the baseline scenario is the electricity generation by grid connected fossil fuel dominated power plants confirming to Annex 3 of EB 22.

Further, the baseline alternative mentioned above is in compliance with all the applicable regulatory policies and laws. Additionally, the project participant is under no compulsion to opt for any particular technology or even a renewable mode of power generation. There is no governmental body or EB policy which requires a particular kind of fuel to be chosen and there is no legal requirement to which the above alternative does not conform.

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 14 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
$EF_{grid,CM,y}$	0.9368 tCO <sub>2</sub> /MWh	Combined margin CO <sub>2</sub> 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 <sub>2</sub> Emission Database, Version 14.0, Dec 2018 published by Central Electricity Authority (CEA), Government of India
$EF_{grid,OM,y}$	0.9610 tCO <sub>2</sub> /MWh	Operating margin CO <sub>2</sub> emission factor for the project electricity system in year y	Calculated as the last 3 year (2015-16, 2016-17, 2017-18) generation-weighted average, sourced from Baseline CO <sub>2</sub> Emission Database, Version 14.0, Dec 2018 published by Central Electricity Authority (CEA), Government of India
$EF_{grid,BM,y}$	0.8644 tCO <sub>2</sub> /MWh	Build margin CO <sub>2</sub> emission factor for the project electricity system in year y	Baseline CO <sub>2</sub> Emission Database, Version 14.0, Dec 2018 published by Central Electricity Authority (CEA), Government of India

## Calculation of Baseline Emission

As per the approved consolidated Methodology ACM0002 (Version 20.0) para 39

Baseline emissions include only CO<sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid- connected power plants. The baseline emissions are to be calculated as follows:

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

Where:

$BE_y$  = Baseline emissions in year y (tCO<sub>2</sub>e/yr)

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- $EG_{PJ,y}$  = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh/yr)
- $EF_{grid,CM,y}$  = Combined margin CO<sub>2</sub> emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO<sub>2</sub>e/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<sub>2</sub> Baseline Database for the Indian Power Sector, Version 14, Dec 2018<sup>9</sup> published by Central Electricity Authority (CEA), Government of India has been used for the calculation of emission reduction.

As per Methodological tool: Tool to calculate the emission factor for an electricity system (Version 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<sub>2</sub> 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	<b>Rajasthan</b>
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	West Bengal	Dadar & Nagar Haveli	Meghalaya	Tamil Nadu
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Telangana

<sup>9</sup> [http://www.cea.nic.in/reports/others/thermal/tpece/cdm\\_co2/user\\_guide\\_ver14.pdf](http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf)

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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)

	2013-14	2014-15	2015-16	2016-17	2017-18
India	18.6%	16.8%	15.1%	14.6%	14.3%

Data Source: Central Electricity Authority (CEA) database Version 14, Dec 2018<sup>10</sup>

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<sub>2</sub> emissions per unit net electricity generation (tCO<sub>2</sub>/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:

<sup>10</sup> [http://www.cea.nic.in/reports/others/thermal/tpece/cdm\\_co2/user\\_guide\\_ver14.pdf](http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf)

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**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.

## 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)			
	2015-16	2016-17	2017-18
INDIAN Grid	8,71,753	9,16,278	9,60,693

Simple Operating Margin (tCO <sub>2</sub> /MWh) (incl. Imports)			
	2015-16	2016-17	2017-18
INDIAN Grid	0.9655	0.9636	0.9543

Weighted Generation Operating Margin	
INDIAN Grid	0.9610

## 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.

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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.

<b>Build Margin (tCO<sub>2</sub>/MWh) (not adjusted for imports)</b>	
	<b>2017-18</b>
INDIAN Grid	<b>0.8644</b>

## Step 6: Calculate the combined margin (CM) emission factor (EF<sub>grid,CM,y</sub>)

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<sub>grid,CM,y</sub>) is based on one of the following methods:

- (a) Weighted average CM; or
- (b) Simplified CM.

PP has chosen option (a) i.e weighted average CM to calculate the combined margin emission factor for the project activity.

The combined margin emissions factor is calculated as follows:

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

Where:

- EF<sub>grid,BM,y</sub> = Build margin CO<sub>2</sub> emission factor in year y (t CO<sub>2</sub>/MWh)
- EF<sub>grid,OM,y</sub> = Operating margin CO<sub>2</sub> emission factor in year y (t CO<sub>2</sub>/MWh)
- W<sub>OM</sub> = Weighting of operating margin emissions factor (per cent)
- W<sub>BM</sub> = Weighting of build margin emissions factor (per cent)

The following default values should be used for W<sub>OM</sub> and W<sub>BM</sub>:

Solar and solar power generation project activities: W<sub>OM</sub>= 0.75 and W<sub>BM</sub>= 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.

$$\begin{aligned} \text{Therefore, } EF_{grid,CM,y} &= 0.9610 * 0.75 + 0.8644 * 0.25 \\ &= \mathbf{0.9368 \text{ t CO}_2/\text{MWh}} \end{aligned}$$

## Baseline emission factor (EF<sub>y</sub>)

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

$$\text{Therefore, } EF_y = EF_{grid,CM,y} = 0.9368 \text{ tCO}_2/\text{MWh}.$$

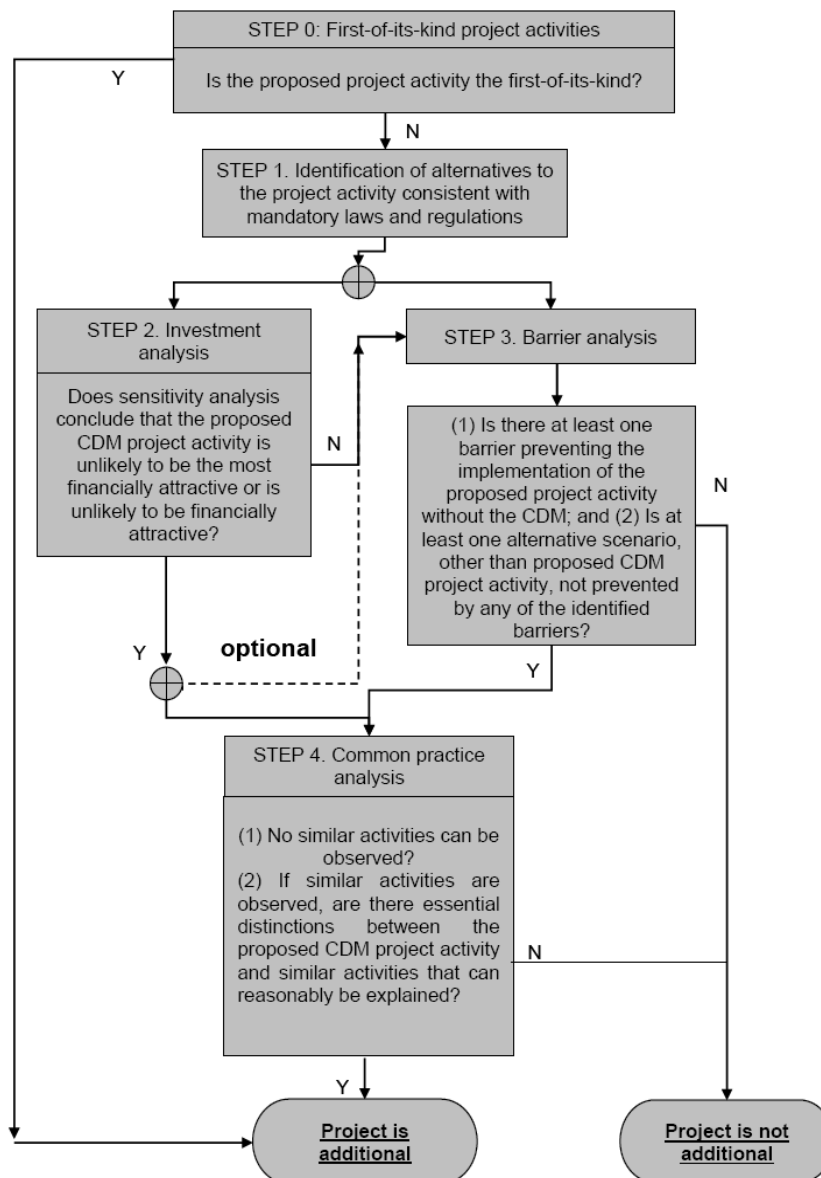
$$\begin{aligned} BE_y &= 832,550 \times 0.9368 \\ &= \mathbf{779,933 \text{ tCO}_2\text{e}} \end{aligned}$$

## 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 20.0). 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:



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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**

As per the applied methodology ACM0002 version 20.0; Para 22, if the project activity is the installation of a Greenfield power plant, the baseline scenario is electricity generated by the project activity would have otherwise been generated by the operation of grid connected power plant and by the addition of new generation sources.

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

## **Step 2: Investment analysis**

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**

As per "Tool for the demonstration and assessment of additionality" (version 07.0.0, EB 70 annex 08), for financial analysis of the project, the following three options are available:

Option I: Simple Cost Analysis

Option II: Investment Comparison Analysis

Option III: Benchmark Analysis

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

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

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

The guidance of Investment Analysis is used for project activity. As per guidance Required/expected returns on equity are appropriate benchmarks for an equity IRR. Therefore, the Expected return on equity is considered appropriate benchmark.

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

### **Choice of Benchmark:**

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As per Investment Analysis tool, Required/expected returns on equity are appropriate benchmarks for 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 07 of methodological tool "Investment Analysis" (version 7 & 8) were the latest available tools to the PP at the time of decision making. However, the request for registration for Version 7 could be submitted till 31/10/2017 and for version 8 the registration request could be submitted till 28/11/2018. Hence, PP has used Methodological Tool for Investment Analysis version 09 (EB 101, Annex 11). Upon comparison of the detail of version 07.0, 08.0 and version 09.0 of the methodological tools it was observed that, there is no major difference in the versions except for the change of default value for benchmark calculation. The default value as mentioned in version 07 was 11.06% for the group 1 projects in India, in the version 08 it was 10.73% for group 1 project in India and Value as mentioned in version 09 is 9.79% for group 1 project in India which is clearly more conservative than version 07 & 08 values. Hence, version 09 is used which is appropriate and more conservative for benchmark calculation and PP has considered the same tool for default value of return on equity for the respective SPVs. The default value of Return on Equity for Group-1 projects in India is 9.79 % as per EB 101, Annex 11.

### **Appropriateness of using benchmark analysis for additionality demonstration and its conformity to guidance 16 of Annex 11, EB 101<sup>11</sup> -**

Considering the fact that the alternative to the project is the supply of electricity from the grid & the choice of the developer is to invest or not to invest, benchmark analysis has been considered appropriate to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest. Benchmark analysis has been considered appropriate for demonstration of additionality, which is in conformity with guidance 16 of Annex 11 EB 101.

### **Benchmark Calculation**

As per the guidelines of Methodological Tool- Investment Analysis para 15, "The applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for an equity IRR. Benchmarks supplied by relevant national authorities are also appropriate". Since in this project activity, equity IRR has been considered as financial indicator, hence as per guidance 16, Required/expected returns on equity are considered as appropriate benchmarks and benchmark supplied by relevant national authorities has been used.

Since the choice of benchmark is based upon parameters that are standard in the market, hence as per Guidance 19 of EB 101 Annex 11, "the cost of equity should be determined either by: (a) selecting the values provided in the Appendix; or by (b) calculating the cost of equity using CAPM". Hence as per option (a), the default value for India is being considered as per the value provided in Appendix of EB 101 Annex 11.2. The benchmark thus selected complies as per the relevant guidelines on Investment Analysis.

Further as per guidance 16 of EB 101 Annex 11, "In situations where an investment analysis is carried out in nominal terms and the available IRR benchmarks are in real terms, project participants shall convert the real term values of benchmarks 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

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<sup>11</sup> <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v9.0.pdf>

<sup>12</sup> <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v9.0.pdf>

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period". Following the above guidance, the default value is being converted to nominal values by adding inflation rate for 10 years<sup>13</sup>, as per the inflation forecast rate provided by Reserve Bank of India.

## Default Value Benchmark:

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 A in EB 101, Annex 11 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 9.79%

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

Nominal Benchmark<sup>14</sup> =  $\{(1+\text{Real Benchmark}) \times (1+\text{Inflation rate})\} - 1$

Where:

- Default value for Real Benchmark = 9.79%

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

## Benchmark estimation:

Appendix A in EB 101, Annex 11 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 9.79%

Inflation Forecast for India as per RBI website<sup>15</sup>:

Project Investor	Inflation Forecast WPI Median value from RBI	Benchmark
SB Energy One Pvt Ltd	3.30%	13.41%
SB Energy Three Pvt Ltd	3.30%	13.41%

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

Input values used in all investment analysis shall be valid and applicable at the time of the investment decision taken by the project participant which can be clearly validated by the DOE, thus it complies with guidance 10 of EB 101, Annex 1116. Key assumptions used for calculating post-tax Equity IRR applicable at the time of investment decision, which is in line with are set out below:

Input Values for 300 MW Solar PV project by SB Energy One Pvt. Ltd are as follows:

Cost of the Project Activity	
SPV Name	SB Energy One Private Limited
Project Location	Bhadla

<sup>13</sup> Since RBI provides inflation forecast only for 5 years and 10 years, hence inflation forecast for 10 years is being considered keeping in view length of crediting period to be 7 years.

<sup>14</sup> As per Pg. 320 of Corporate Finance, Second Edition of Aswath Damodaran

<sup>15</sup> <https://rbi.org.in/Scripts/PublicationsView.aspx?id=17759>

<sup>16</sup> It is to be noted here that at the time of investment making decision, Methodological Tool for Investment Analysis version 07 (EB 92 Annex 5) was applicable, however Request for Registration can be submitted only till 28/06/2018. Hence PP has used Methodological Tool for Investment Analysis version 09.

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State	Rajasthan
AC Project Capacity (MW)	300
Expected Date of Commissioning	31-Aug-2018
Life of Plant in years	25
	DPR
	14-Mar-17

in INR MN

Items	Cost	Tax	Cost + Tax
Total Project Cost	15,000.00	-	15,000.00
Total	15,000.00	-	15,000.00
O&M Expenses	150.00	-	150.00
	5% Escalation, starting from 2nd Yr.		

Assumptions and Values considered for Financial Analysis are as follows:

SB Energy One Private Limited		Equity IRR	Benchmark (Equity IRR)
		3.19%	13.41%
Assumption and financial of the project			
Details of the project		Source	Link
State where the project is situated	Rajasthan	As per DPR	
Total Capacity (MW)	300.00	As per DPR	
Expected Date of Commissioning	31-Aug-18	As per DPR	
Life of the plant (Yrs.)	25	As per DPR	
Generation of electricity			
PLF (%)	24.00%	As per DPR and also as per Rajasthan tariff order	<a href="http://rerc.rajasthan.gov.in/TariffOrders/Order216.pdf">http://rerc.rajasthan.gov.in/TariffOrders/Order216.pdf</a>
Annual generation (kWh)	630,720,000	Calculated Value	
Annual Degradation per year	0.50%	As per DPR and per Rajasthan tariff order	<a href="http://rerc.rajasthan.gov.in/TariffOrders/errorPG">http://rerc.rajasthan.gov.in/TariffOrders/errorPG</a>
Tariff rate at the decision making (INR/kWh)	2.45	As per DPR	
Operation and maintenance cost and Insurance			
O & M Expenses (INR Mn.)	150.00	As per DPR	
Escalation in the operational expenses (%)	5.00%	As per DPR	
Insurance (INR Mn.)	150.00	CERC order	<a href="http://www.cercind.gov.in/2016/orders/SO17.pdf">http://www.cercind.gov.in/2016/orders/SO17.pdf</a>

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<b>Financial parameters</b>			
TOTAL COST (INR Mn.)	15,000.00	As Per DPR	
Loan Amount (INR Mn.)	10,500.00	As Per DPR	
Equity Investment (INR Mn.)	4,500.00	As Per DPR	
<b>Term loan</b>			
Loan Amount (INR Mn.)	10,500.00	As Per DPR	
Interest rate (%)	11.00%	As Per DPR	
Loan Tenure (Qtr.)	48	Assumption	
Moratorium Period (Qtr.)	-	Assumption	
Repayment Period (Qtr.)	48	Calculated Value	
Repayment instalments value (INR Mn.)	218.750	Calculated Value	
1st instalment from (Qtr. end)	31-Dec-18	Considered from the next Quarter End	
<b>Book Depreciation (SLM Method)</b>			
Gross Depreciable Value (INR Mn.)	15,000.00	Calculated Value	
Salvage Value (%)	10.00%		
Salvage value (INR Mn.)	1,500.00	Calculated Value	
Net Depreciable Value (INR Mn.)	13,500.00	Calculated Value	
Residual Value (INR Mn.)	1,500.00	Calculated Value	
<b>IT Depreciation</b>			
IT Depreciation (%)	80%	IT act	<a href="https://www.incometaxindia.gov.in/charts%20%20tables/depreciation%20rates.htm">https://www.incometaxindia.gov.in/charts%20%20tables/depreciation%20rates.htm</a>
<b>Income Tax</b>			
Financial Year	FY 2018-19		
Income tax rate (%)	30.00%	As Per Income Tax Rule, Pg 29, Para E(l)	<a href="https://www.indiabudget.gov.in/budget2017-2018/ub2017-18/fb/bill.pdf">https://www.indiabudget.gov.in/budget2017-2018/ub2017-18/fb/bill.pdf</a>
Corporate Tax / MAT (%)	33.00%	As Per IT rule	<a href="https://www.bankbazaar.com/tax/corporate-tax.html">https://www.bankbazaar.com/tax/corporate-tax.html</a>
GST (%)	18.00%	As Per Income Tax Rule	<a href="https://www.indiabudget.gov.in/budget2017-2018/ub2017-18/fb/bill.pdf">https://www.indiabudget.gov.in/budget2017-2018/ub2017-18/fb/bill.pdf</a>
Surcharge (%)	10.00%	As Per Income Tax Rule	<a href="https://taxguru.in/income-tax/income-tax-slabs-ay-201819-fy-201718.html">https://taxguru.in/income-tax/income-tax-slabs-ay-201819-fy-201718.html</a>
Education cess (%)	4.00%	As Per Income Tax Rule, Pg 5, 11 and 12	<a href="https://taxguru.in/income-tax/education-cess-increased-3-4-health-education-cess-fy201819-effect-taxpayers-tax-liability.html">https://taxguru.in/income-tax/education-cess-increased-3-4-health-education-cess-fy201819-effect-taxpayers-tax-liability.html</a>

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Final Tax rates			
Income tax rate (%)	34.32%	Calculated Value	
MAT (%)	37.75%	Calculated Value	
Service Tax (%)	18.72%	Calculated Value	

Sensitivity Analysis of the project are as follows:

Final Results	Equity IRR		Benchmark (Equity IRR)	
	3.19%		13.41%	
Sensitivity Analysis	Equity IRR			
Variation %	-10%	Normal	10%	Breaching Value
PLF	0.81%	3.19%	5.73%	35.40%
O&M	3.64%	3.19%	2.73%	-242.40%
Project Cost	5.51%	3.19%	1.44%	-29.29%
Tariff Rate	0.81%	3.19%	5.73%	35.40%

Input Values for 100 MW Solar PV project by SB Energy Three Pvt. Ltd are as follows:

Cost of the Project Activity	
SPV Name	SB Energy Three Private Limited
Project Location	Bhadla
State	Rajasthan
AC Project Capacity (MW)	100
Expected Date of Commissioning	31-Aug-2018
Life of Plant in years	25
<b>DPR</b>	
8-Mar-17	

in INR MN

Items	Cost	Tax	Cost + Tax
Total Project Cost	5,000.00	-	5,000.00
<b>Total</b>	<b>5,000.00</b>	<b>-</b>	<b>5,000.00</b>
O&M Expenses	50.00	-	50.00

5% Escalation, starting from 2nd Yr.

Assumptions and Values considered for Financial Analysis are as follows:

SB Energy Three Private Limited	Equity IRR	Benchmark (Equity IRR)
	3.19%	13.41%

Assumption and financial of the project			
Details of the project		Source	Link
State where the project is situated	Rajasthan	As per DPR	

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Total Capacity (MW)	100.00	As per DPR	
Expected Date of Commissioning	31-Aug-18	As per offer letter	
Life of the plant (Yrs.)	25	As per DPR	
Generation of electricity			
PLF (%)	24.00%	As per DPR	
Annual generation (kWh)	210,240,000	Calculated Value	
Annual Degradation per year	0.50%	As per DPR and per Rajasthan tariff order	<a href="http://rerc.rajasthan.gov.in/TariffOrders/errorPG">http://rerc.rajasthan.gov.in/TariffOrders/errorPG</a>
Tariff rate at the decision making (INR/kWh)	2.45	As per DPR	
Operation and maintenance cost and Insurance			
O & M Expenses (INR Mn.)	50.00	As per DPR	
Escalation in the operational expenses (%)	5.00%	As per DPR	
Insurance (INR Mn.)	50.00	CERC order	<a href="http://www.cercind.gov.in/2016/orders/SO17.pdf">http://www.cercind.gov.in/2016/orders/SO17.pdf</a>
Financial parameters			
TOTAL COST (INR Mn.)	5,000.00	As Per DPR	
Loan Amount (INR Mn.)	3,500.00	As Per DPR	
Equity Investment (INR Mn.)	1,500.00	As Per DPR	
Term loan			
Loan Amount (INR Mn.)	3,500.00	As Per DPR	
Interest rate (%)	11.00%	As Per DPR	
Loan Tenure (Qtr.)	48	Assumption	
Repayment Period (Qtr.)	48	Calculated Value	
Repayment instalments value (INR Mn.)	72.917	Calculated Value	
1st instalment from (Qtr. end)	31-Dec-18	Considered from the next Quarter End	
Book Depreciation (SLM Method)			
Gross Depreciable Value (INR Mn.)	5,000.00	Calculated Value	
Salvage Value (%)	10.00%		

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Salvage value (INR Mn.)	500.00	Calculated Value	
Net Depreciable Value (INR Mn.)	4,500.00	Calculated Value	
Residual Value (INR Mn.)	500.00	Calculated Value	
<b>IT Depreciation</b>			
IT Depreciation(%)	80%	IT act	<a href="https://www.incometaxindia.gov.in/charts%20%20tables/depreciation%20rates.htm">https://www.incometaxindia.gov.in/charts%20%20tables/depreciation%20rates.htm</a>
<b>Income Tax</b>			
Financial Year	FY 2018-19		
Income tax rate (%)	30.00%	As Per Income Tax Rule, Pg 29, Para E(I)	<a href="http://indiabudget.nic.in/budget2015-2016/ub2015-16/fb/bill.pdf">http://indiabudget.nic.in/budget2015-2016/ub2015-16/fb/bill.pdf</a>
Corporate Tax / MAT (%)	33.00%	As Per IT rule	<a href="https://www.bankbazaar.com/tax/corporate-tax.html">https://www.bankbazaar.com/tax/corporate-tax.html</a>
Service Tax (%)	18.00%	As Per Income Tax Rule	<a href="http://taxguru.in/service-tax/service-tax-rate-chart-effect-01062016.html">http://taxguru.in/service-tax/service-tax-rate-chart-effect-01062016.html</a>
Surcharge (%)	10.00%	As Per Income Tax Rule	<a href="http://taxguru.in/income-tax/income-tax-rate-chart-assessment-year-201516-financial-year-201415.html">http://taxguru.in/income-tax/income-tax-rate-chart-assessment-year-201516-financial-year-201415.html</a>
Education cess (%)	4.00%	As Per Income Tax Rule, Pg 5, 11 and 12	<a href="http://taxguru.in/income-tax/income-tax-rate-chart-slabs-for-ay-2017-18-fy-2016-17.html">http://taxguru.in/income-tax/income-tax-rate-chart-slabs-for-ay-2017-18-fy-2016-17.html</a>
<b>Final Tax rates</b>			
Income tax rate (%)	34.32%	Calculated Value	
MAT (%)	37.75%	Calculated Value	
Service Tax (%)	18.72%	Calculated Value	

Sensitivity Analysis of the project are as follows:

Final Results	Equity IRR		Benchmark (Equity IRR)	
	3.19%		13.41%	
<b>Sensitivity Analysis</b>	<b>Equity IRR</b>			
Variation %	-10%	Normal	10%	Breaching Value
PLF	0.81%	3.19%	5.73%	35.39%
O&M	3.64%	3.19%	2.73%	-242.56%
Project Cost	5.51%	3.19%	1.44%	-29.29%
Tariff Rate	0.81%	3.19%	5.73%	35.39%

The project activity cannot be considered as financially attractive as the equity IRR for the project activity is less than the Benchmark.

Project Investor	Equity IRR	Benchmark (Equity IRR)
SB Energy One Pvt. Limited (300 MW)	3.19%	13.41%

Project Investor	Equity IRR	Benchmark (Equity IRR)
SB Energy Three Pvt. Limited (100 MW)	3.19%	13.41%

### 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 101, Annex 11, 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.

<b>Probability to breach the benchmark:</b>
<b>Sensitivity Parameter 1 : PLF</b>
PLF considered in financials for is as per DPR submitted by PP to financial institutions which is in line with "Guidelines for the reporting and validation of Plant load factors" stated in EB48 Annex11 option 3(a).
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.
<b>Sensitivity Parameter 2 : O&amp;M</b>

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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 400 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%	600	MW
Capacity of the proposed project activity	400	MW
-50%	200	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;

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(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 (GS4GG-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 12-March-2018. Therefore projects, which have started commercial operation before 12-March-2018, have been considered for analysis.

Numbers of Similar projects identified, which fulfil above-mentioned conditioned are

**N<sub>Solar</sub> = 0**

State wise commissioning status of grid connected Solar Power Projects (As on 31.03.2017)- MNRE, India and Publically available data for solar projects in Rajasthan till March 2017<sup>17</sup>.

<http://mnre.gov.in/file-manager/UserFiles/state-wise-commissioned-grid-connected-solar-power-projects.htm>

List of Solar Projects in Rajasthan (RRECL- Website) as on 31.10.2016. The projects of having capacity of 200 MW to 600 MW was being considered from publically available data till Oct 2016

<http://energy.rajasthan.gov.in/content/dam/raj/energy/rrecl/pdf/Activities/Solar/4.37%20Details%20of%20commissioned%20Solar%20Projects.pdf>

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<sup>17</sup> The source does not provide the COD dates, however the list of eligible projects are being identified from the same source as it provides list of solar projects commissioned till 31/03/2017 and hence the latest available source of information. The list of identified projects are being crosschecked from the second source and all the projects falling in the identified range have been included for further consideration.

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

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.

$$N_{all} = 0$$

**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.

$$\begin{aligned} \text{Calculate } F &= 1 - N_{diff}/N_{all} \\ F &= 1 - (0/0) = 1 \end{aligned}$$

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.  $N_{all} - N_{diff} = 0$ ; 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.**

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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
<b>SDG 7 – Affordable and Clean Energy:</b> 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 (7.2.1 Renewable energy share in the total final energy consumption)
<b>SDG 8 – Decent Work and Economic Growth:</b> 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  8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training	1. No. of trainings provided to the employees (8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training)  2. Employment generated and better salary given due to project activity (8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities)
<b>SDG 13 – Climate Action:</b> 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 <sub>2</sub>

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

SDG Goal	Methodological choices/approaches for estimating the SDG outcome
<b>SDG 7 –Affordable and Clean Energy :</b> Ensure access to affordable, reliable, sustainable and modern energy for all	<b>Measurement Method:</b> - 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.  <b>QA/QC Process:</b> This parameter is monitored monthly and value of parameter will be cross checked with invoices. The meters will be calibrated on regular frequency.
<b>SDG 8 – Decent Work and Economic Growth:</b> Promote inclusive and sustainable economic growth, employment and decent work for all	<b>Measurement Method:</b> - 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 <b>QA/QC Process:</b> 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.

<p><b>SDG 13 – Climate Action :</b> Take urgent action to combat climate change and its impacts</p>	<p><b>Measurement Method:</b> - 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<sub>2</sub> Baseline Database for Indian Power Sector” version 14, 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 7.0”. The emission reductions are calculated as per registered PDD and as per methodology requirement.</p> <p><b>QA/QC Process:</b> This parameter is calculated, and no any QA/QC procedure required.</p>
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### B.6.3. Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

- SDG13 : Climate Action :** The project would lead to reduction of approx 779,933 tCO<sub>2</sub>e per annum
- SDG 7 : Affordable and Clean Energy :** The project is expected to generate 832,550 MWh of clean energy per annum
- SDG 8 : Decent Work and Economic Growth :** The project provides employment to at least 10 persons and minimum 1 training per year.

<b>Relevant SDG Indicator</b>	<b>SDG 13</b>
<b>Data/parameter</b>	<b>EF<sub>grid,OM,y</sub></b>
<b>Unit</b>	tCO <sub>2</sub> /MWh
<b>Description</b>	Operating Margin CO <sub>2</sub> emission factor in year y
<b>Source of data</b>	Calculated from CEA database, Version 14, Dec 2018 <sup>18</sup>
<b>Value(s) applied</b>	0.9610
<b>Choice of data or Measurement methods and procedures</b>	Calculated as per “Tool to calculate the emission factor for an electricity system, version 07” as per the latest data available for the most three recent years 2015-16, 2016-17 and 2017-18. The data is obtained from “CO <sub>2</sub> Baseline Database for Indian Power Sector” version 14, published by the Central Electricity Authority, Ministry of Power, Government of India.
<b>Purpose of data</b>	For the calculation of the Baseline Emission
<b>Additional comment</b>	This parameter is fixed ex-ante for the entire crediting period.

<b>Relevant SDG Indicator</b>	<b>SDG 13</b>
<b>Data/parameter</b>	<b>EF<sub>grid,BM,y</sub></b>
<b>Unit</b>	tCO <sub>2</sub> /MWh
<b>Description</b>	Build Margin CO <sub>2</sub> emission factor in year y
<b>Source of data</b>	Calculated from CEA database, Version 14, Dec 2018
<b>Value(s) applied</b>	0.8644
<b>Choice of data or Measurement methods and procedures</b>	Calculated as per “Tool to calculate the emission factor for an electricity system, version 07” as per the latest data available for the most recent year 2017-18. The data is obtained from “CO <sub>2</sub> Baseline Database for Indian Power Sector” version 14, published by the Central Electricity Authority, Ministry of Power, Government of India.
<b>Purpose of data</b>	For the calculation of the Baseline Emission
<b>Additional comment</b>	This parameter is fixed ex-ante for the entire crediting period.

<sup>18</sup> [http://www.cea.nic.in/reports/others/thermal/tpece/cdm\\_co2/user\\_guide\\_ver14.pdf](http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf)

<b>Relevant SDG Indicator</b>	<b>SDG 13</b>
<b>Data/parameter</b>	<b>EF<sub>grid,CM,y</sub></b>
<b>Unit</b>	tCO <sub>2</sub> /MWh
<b>Description</b>	Combined Margin CO <sub>2</sub> emission factor in year y
<b>Source of data</b>	Calculated from CEA database, Version 14, Dec 2018
<b>Value(s) applied</b>	0.9368
<b>Choice of data or Measurement methods and procedures</b>	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 <sub>grid,BM,y</sub> = Build margin CO <sub>2</sub> emission factor in year y (tCO <sub>2</sub> /MWh) EF <sub>grid,OM,y</sub> = Operating margin CO <sub>2</sub> emission factor in year y (tCO <sub>2</sub> /MWh) W <sub>OM</sub> = Weighting of operating margin emissions factor (%) = 75% W <sub>BM</sub> = Weighting of build margin emissions factor (%) = 25%
<b>Purpose of data</b>	For the calculation of the Baseline Emission
<b>Additional comment</b>	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<sub>y</sub>) is calculated as follows:

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

Where:

BE <sub>y</sub>	=	Baseline emissions in year y (t CO <sub>2</sub> )
EG <sub>PJ,y</sub>	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
EF <sub>grid,CM,y</sub>	=	Combined margin CO <sub>2</sub> emission factor for grid connected power generation in year y

$$BE_y = 832,550 \text{ MWh/annum} \times 0.9368 \text{ tCO}_2/\text{MWh} \\ = 779,933 \text{ tCO}_2\text{e/annum}$$

$$ER_y = BE_y - PE_y$$

Where:

ER <sub>y</sub>	=	Emission reductions in year y (t CO <sub>2e</sub> )
BE <sub>y</sub>	=	Baseline emissions in year y (t CO <sub>2e</sub> )
PE <sub>y</sub>	=	Project emissions in year y (t CO <sub>2e</sub> )

$$\text{Therefore, } ER_y = 779,933 - 0$$

$$= 779,933 \text{ tCO}_2\text{e/annum}$$

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## SDG 8 : Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possible in the baseline scenario. The project provides employment to around 10 persons. Also people are getting better salary as compared to local level due to implementation of the project activity.

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  $EG_{P,Y}$  expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.

Year	Baseline estimate	Project estimate	Net benefit
01/01/2019 to 31/12/2019	787,811	0	787,811
01/01/2020 to 31/12/2020	783,872	0	783,872
01/01/2021 to 31/12/2021	779,933	0	779,933
01/01/2022 to 31/12/2022	775,994	0	775,994
01/01/2023 to 31/12/2023	772,055	0	772,055
<b>Total</b>	<b>3,899,665</b>	<b>0</b>	<b>3,899,665</b>
<b>Total number of crediting years</b>	<b>5</b>		
<b>Annual average over the crediting period</b>	<b>779,933</b>	<b>0</b>	<b>779,933</b>

#### SDG 7 : Affordable and Clean Energy

Year	Baseline estimate	Project estimate	Net benefit
01/01/2019 to 31/12/2019	0	840,960	840,960
01/01/2020 to 31/12/2020	0	836,755	836,755
01/01/2021 to 31/12/2021	0	832,550	832,550
01/01/2022 to 31/12/2022	0	828,346	828,346
01/01/2023 to 31/12/2023	0	824,141	824,141
<b>Total</b>	<b>0</b>	<b>4,162,752</b>	<b>4,162,752</b>
<b>Total number of crediting years</b>	<b>5</b>		

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Annual average over the crediting period	0	832,550	832,550
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Since project activity is renewable electricity generation, the quantity of Affordable and Clean Energy is mentioned under project estimate. In baseline, no any renewable energy generation, hence mentioned as zero.

## SDG 8 : Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possible in the baseline scenario. The project provides employment to around 10 persons. Also due to implementation of project activity, the local people are getting better salary than than national average.

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	7.2.1 Renewable energy share in the total final energy consumption
Data / Parameter	EG <sub>P,y</sub>
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	832,550 (estimated)
Measurement methods and procedures	<p>Net electricity supplied to the grid by the project plant in a given month = Export, kWh – Import, kWh</p> <p>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 &amp; check meters (ABT Meters) having accuracy class of 0.25. The export/import losses between these two substations are apportioned based on pooling substation readings.</p> <p>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.</p>
Monitoring frequency	Continuous measurement & monthly recording
QA/QC procedures	<p>The meters are approved, tested &amp; sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years<sup>19</sup>. 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.</p>

<sup>19</sup> [http://www.aegcl.co.in/Metering\\_Regulations\\_Of\\_CEA\\_17\\_03\\_2006.pdf](http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf)

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	<p>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.</p> <p>The billing is raised based on substation meters.</p>
<b>Purpose of data</b>	To Monitor the SDG 7 Indicator
<b>Additional comment</b>	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.

<b>Relevant SDG Indicator</b>	<b>SDG 13</b>
<b>Data / Parameter</b>	<b>ER<sub>y</sub></b>
<b>Unit</b>	tCO <sub>2e</sub> /year
<b>Description</b>	Emission reductions achieved per year
<b>Source of data</b>	As per Estimated ER sheet. During the verification, the results shall be obtained from the Actual ER sheet.
<b>Value(s) applied</b>	779,933 (estimated)
<b>Measurement methods and procedures</b>	The baseline emissions are the product of electrical energy baseline E <sub>GP,y</sub> expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.
<b>Monitoring frequency</b>	As per monitoring period
<b>QA/QC procedures</b>	Not Applicable
<b>Purpose of data</b>	To Monitor the SDG 13 Indicator
<b>Additional comment</b>	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

<b>Relevant SDG Indicator</b>	<b>8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities</b>
<b>Data / Parameter</b>	<b>Number of employment generation and Better Salary</b>
<b>Unit</b>	Number and Rupees
<b>Description</b>	Number of people employed directly due to the project activity
<b>Source of data</b>	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
<b>Value(s) applied</b>	10
<b>Measurement methods and procedures</b>	<p>The total number of persons working in the plant would be calculated based on the daily log available at site.</p> <p>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.</p> <p>"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".</p>

	Also due to implementation of project activity, local people are getting better salary than national average.
<b>Monitoring frequency</b>	Monthly monitoring and annual compilation
<b>QA/QC procedures</b>	The number of persons employed would be mentioned in the plant register, which can be crossed checked with attendance register.
<b>Purpose of data</b>	To Monitor the SDG 8 Indicator
<b>Additional comment</b>	-

<b>Relevant SDG Indicator</b>	<b>8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training</b>
<b>Data / Parameter</b>	<b>Quality of Employment</b>
<b>Unit</b>	-
<b>Description</b>	Training of Staff
<b>Source of data</b>	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
<b>Value(s) applied</b>	1 training per year
<b>Measurement methods and procedures</b>	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. The training will be based upon soft as well as hard skills such as Behaviourial changes, computer skills, safety procedures, working at height etc.
<b>Monitoring frequency</b>	Annual
<b>QA/QC procedures</b>	The training records for all the employees
<b>Purpose of data</b>	To Monitor the SDG 8 Indicator
<b>Additional comment</b>	-

## 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:**

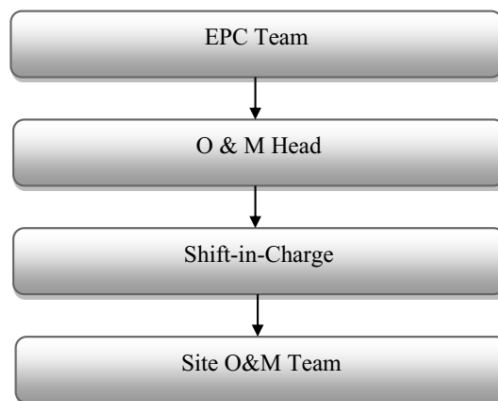
The monitoring plan is developed in accordance with the modalities and procedures for project activities and is proposed for grid-connected Solar power project being implemented within India territory. The

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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

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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 (O & M 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

01/01/2019 (Registration Date in GS4GG is 10/04/2020), being a retroactive project Crediting period will start from 01/01/2019 which is within 2 years prior to Design Certification date.

The project activity is registered as a part of bundle project activity in VCS20 and emission reductions were claimed till 31/12/

. Thus the Crediting Period under GS4GG will start from 01/01/2019.

Further since the start date of crediting period under VCS was 27/02/2017 and total emission reductions claimed from a project activity cannot exceed the total limit of 15 years combining all the emissions years from all the standards. Therefore the end date of crediting period under GS4GG will be 26/02/2032.

### 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	<p>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 the Universal Declaration of Human Rights.</p> <p>2. The Project shall not discriminate with regards to participation and inclusion.</p>	No	<p>The Project is not in conflict with the economic livelihood of the local community.</p> <p>The Project does not cause any human rights abuse and respects internationally proclaimed human rights issue.</p> <p>Further, the Project meets the Indian labour law requirements thus does not cause any human rights abuse.</p> <p>India has ratified the United Nations Human Rights Rules and regulations. The India</p>	Not Applicable

<sup>20</sup> <https://registry.verra.org/app/projectDetail/VCS/1805>

			<p>ratified the same as per web link<sup>21</sup> given below</p> <p>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<sup>22</sup></p> <p>International Covenant on Civil and Political Rights India Accession 10.04.79<sup>23</sup>          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.</p> <p>The host country prohibits discrimination on the basis of a person's race, sex, religion, place of birth, or social status.</p>	
3.2 Gender Equality and Women's Rights	<p>1. The Project shall complete the following gender assessment questions in order to inform Requirements 2-4, below:</p> <ul style="list-style-type: none"> <li>• Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?</li> <li>• Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities</li> </ul>	No	<p>There a no possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits.</p> <p>There is no any possibility that the Project can adversely affect men and women in marginalised or vulnerable communities.</p> <p>Project does not take into account gender roles and the abilities of women or men to participate in the</p>	Not Applicable

<sup>21</sup> [http://tbinternet.ohchr.org/\\_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN](http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN)

<sup>22</sup> <http://hrlibrary.umn.edu/research/ratification-india.html> and [http://tbinternet.ohchr.org/\\_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN](http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN)

<sup>23</sup> <http://hrlibrary.umn.edu/research/ratification-india.html> and [http://tbinternet.ohchr.org/\\_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN](http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN)

	<p>(e.g., potential increased burden on women or social isolation of men)?</p> <ul style="list-style-type: none"> <li>• 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)?</li> <li>• 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)?</li> <li>• 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?</li> <li>• 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?</li> <li>• 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</li> </ul>		<p>decisions/designs of the project's activities.</p> <p>Project does not take into account gender roles and the abilities of women or men to benefit from the Project's activities</p> <p>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</p> <p>Project does not 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.</p> <p>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</p> <p>There is no any likelihood that the proposed Project would expose women and girls to further risks or hazards</p>	
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	<p>accessing and managing environmental goods and services?</p> <ul style="list-style-type: none"> <li>• Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?</li> </ul> <p>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):</p> <ul style="list-style-type: none"> <li>• Sexual harassment and/or any forms of violence against women – address the multiple risks of gender-based violence, including sexual exploitation or human trafficking.</li> <li>• Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls.</li> <li>• Restriction of women’s rights or access to resources (natural or economic).</li> <li>• Recognise women’s ownership rights regardless of marital status – adopt project measures where possible to support to women’s access to inherit and own land, homes, and other assets or natural resources.</li> </ul> <p>3. Projects shall apply the principles of non discrimination, equal treatment, and equal pay for equal work, specifically:</p>		<p>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.</p> <p>There is no any sexual harassment and/or any forms of violence against women.</p> <p>The project does not involve any slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls.</p> <p>The project does not restrict of women’s rights or access to resources.</p> <p>The project Recognise women’s ownership rights regardless of marital status</p> <p>Projects shall apply the principles of non discrimination, equal treatment, and equal pay for equal work.</p> <p>The project has equal opportunity for both men and women. The project has HR policy and same is followed equally.</p>	
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	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status.</li> <li>• Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits.</li> </ul> <p>4. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks.</p>		<p>The project ensures participation of both men and women and they are benefitted based on pregnancy, maternity/paternity leave, or marital status.</p> <p>There is no limit to the access of women or men to Project participation and benefits.</p> <p>India ratified the International Convention on the Elimination of All Forms of Racial Discrimination<sup>24</sup> on 03/12/1968 with certain reservation. The project activity is in line with strategy of elimination of discrimination.</p>	
<p>3.3 Principle 3 – Community Health, Safety and Working Conditions</p>	<p>The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community.</p>	<p>No</p>	<p>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.</p> <p>The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments” - PP ensures safe access and planned prevention to avoid any kind of accident. The HSE (Health and Safety Executive) states</p>	<p>Not Applicable</p>

<sup>24</sup> [http://nhrc.nic.in/documents/india\\_ratification\\_status.pdf](http://nhrc.nic.in/documents/india_ratification_status.pdf)

			<p>that best practice when installing and operation of Solar PV project requires trained, dedicated working at height maintenance teams to access risks and select appropriate equipment before any work is carried out.</p> <p>All the safety and hygiene measures are being ensured in order maintain a safe and healthy environment for the workers at site. In case of any emergency, the site incharge will ensure to take adequate action and preventive measures to avoid any miss happening.</p> <p>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.</p>	
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	<p>No cultural heritage is observed on the project site, thus no harm observed.</p> <p>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.</p> <p>As per the list of cultural heritage sites in India<sup>25</sup> by UNESCO, it is clear that the project site is not a cultural heritage site</p>	Not Applicable
3.4.2 Forced Eviction and Displacement	Does the Project require or cause the physical or economic relocation of peoples (temporary or	No	The project has received the necessary approvals from the local authorities and does not lead to any resettlement.	Not Applicable

<sup>25</sup> <http://whc.unesco.org/en/statesparties/in>

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	permanent, full or partial)?		India ( the Ministry of Rural development have the “The National Rehabilitation and Resettlement Policy, 2007” <sup>26</sup>	
3.4.3 Land Tenure and Other Rights	<p>1. Does the Project require any change to land tenure arrangements and/or other rights?</p> <p>2. For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?</p> <p>Examples include, but are not limited to water access rights, community-based property rights and customary rights.</p>	No	No Expropriation has been conducted on any private land involved in project activity. Land has been utilised by PP directly from the owner of the land through direct negotiation of commercial terms. There has 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.	Not Applicable
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	<p>(a) Does not recognise Projects that engage in, contribute to or reinforce corruption of any kind.</p> <p>The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.</p>	No	<p>The project is renewable energy technology and does not contribute to or reinforce corruption of any kind.</p> <p>Indulgence in corruption is an illegal activity in the host country and the local labour compliance takes into account of the same.</p> <p>The project abides by the United Nations Convention Against Corruption. India ratification <sup>27</sup> is made on 09.05.11</p>	Not Applicable

<sup>26</sup> <http://www.dolr.nic.in/nrrp2007.pdf>

<sup>27</sup> <http://www.unodc.org/unodc/en/treaties/CAC/signatories.html>

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<p>3.6 Principle 6 – Economic Impacts 3.6.1 Labour Rights</p>	<p>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 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.</p> <p>2. Workers shall be able to establish and join labour organisations.</p> <p>3. Working agreements with all individual workers shall be documented and implemented. These shall at minimum comprise:</p> <p>(a) Working hours (must not exceed 48 hours per week on a regular basis), AND</p> <p>(b) Duties and tasks, AND</p> <p>(c) Remuneration (must include provision for payment of overtime), AND</p> <p>(d) Modalities on health insurance, AND</p> <p>(e) Modalities on termination of the contract with provision</p>	<p>Yes</p>	<p>Forced labour is an illegal activity in the host country and the local labour compliance takes into account of the same. Further, India is a party to ILO and forced labour is illegal in India.</p> <p>India have laws in place prohibiting forced and compulsory labour<sup>28</sup></p> <p>The project respects fundamental right of employee. There is law in India since 1926 by The Trade Unions Act, 1926 <sup>29</sup> which protects rights of industrial trade unions and their members.</p> <p>The agreements are in place for permanent employees</p>	<p>Not Applicable</p>
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<sup>28</sup> <http://labour.nic.in/content/>

<sup>29</sup> <http://ncw.nic.in/acts/TheTradeUnionsAct1926.pdf>

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	<p>for voluntary resignation by employee, AND</p> <p>(f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave.</p> <p>4. The Project Developer shall justify that the employment model applied is locally and culturally appropriate.</p> <p>5. Child labour, as defined by the ILO Minimum Age Convention is not allowed.</p> <p>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:</p> <p>(a) Their compulsory schooling (minimum of 6 schooling years) is not hindered, AND</p> <p>(b) The tasks they perform do not harm their physical and mental development, AND</p> <p>(c) The opinions and recommendations of an Expert Stakeholder shall be sought and demonstrated as being included in the Project design.</p> <p>6. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and</p>		<p>The project prefers the local employment and culture is maintained at project site.</p> <p>The country have strict prohibition for child labour<sup>30</sup>. Thus project does not involve child labour during construction and operation of project activity.</p> <p>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.</p>	
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<sup>30</sup> [http://www.indianchild.com/child\\_labour\\_law\\_in\\_india.htm](http://www.indianchild.com/child_labour_law_in_india.htm)

	reporting of accidents and incidents, and emergency preparedness and response measures.			
3.6.2 Negative Economic Consequences	<p>Is project involves Negative Economic Consequences</p> <ol style="list-style-type: none"> <li>1. The Project Developer shall demonstrate the financial sustainability of the Projects implemented, also including those that will occur beyond the Project Certification period.</li> <li>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.</li> </ol>	No	<p>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.</p> <p>The financial sustainability is demonstrated in registered PDD and these calculations are for entire lifetime of project activity.</p> <p>The project does not involve any negative impacts and no any potential risk to local economy. The project leads to economic development of the local area by means of generating employment opportunities for local people either directly or indirectly.</p>	Not Applicable
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?	Yes	<p>The project activity supplies energy to national grid and project activity displaces equivalent quantity of electricity which would have been generated by fossil fuel dominated grid connected power plants.</p> <p>During running condition, self generated power is used. The</p>	Not Applicable

			<p>project activity requires very less electricity from grid and the same is reflecting as import of project activity. The state electricity board is deducting this import consumption from export and net electricity supplied to grid is monitored. Thus import from grid accounts auxiliary consumption of the power plant which is being monitored regularly. The clean energy supply to the grid increases and hence Locals can get benefit of having continuous excess to clean power.</p> <p>During running condition, self generated power is used. The project activity requires very less electricity from grid and the same is reflecting as import of project activity. The state electricity board is deducting this import consumption from export and net electricity supplied to grid is monitored. Thus import from grid accounts auxiliary consumption of the power plant which is being monitored regularly. The clean energy supply to the grid increases and hence Locals can get benefit of having continuous excess to clean power.</p>	
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	No	The project is renewable energy technology and does	Not Applicable

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	and/or water body 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?		not affect Erosion and/or water body stability.	
4.3.1 Landscape 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	Not Applicable

			plants. The project promotes environmental protection through the use of cleaner technology. The project abides by the stipulations of the Indian Environment Protection Act 1986 <sup>31</sup> .	
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.  The project is not located in any HCV areas as per the list of approved HCV areas of India <sup>32</sup> .	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	No	1. There are no endangered species identified as potentially being present within the Project boundary.	Not Applicable

<sup>31</sup> <http://envfor.nic.in/legis/env/env1.html>

<sup>32</sup> <http://natureconservation.in/state-wise-list-of-conservation-reserves-of-india-updated/>

	<p>may route through the area)?</p> <p>2. Does the Project potentially impact other areas where endangered species may be present through trans boundary affects?</p>		<p>2. The Project does not impact other areas where endangered species may be present through trans boundary affects.</p>	
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## 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 – 20/03/2018

Date of Meeting – 27/03/2018

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?

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**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.

The project is submitted to GS4GG under retroactive type as start date of project was prior to first stakeholder consultation round of project activity.

The physical Local stakeholder consultation was carried out by inviting the local stakeholders through public notice on 27/03/2018. The notice was for all Local stakeholders and not a gender specific. Thus gender equality has been followed during consultation. Since project is developed in particular site, for project the nearby local villagers are most relevant and who are directly and indirectly may be affected. Thus putting public notice at project site/nearby village involves engagement of all stakeholders for the project activity. During that physical stakeholder consultation, the project information was given and taken feedback for the project activity. The information about feedback register also given to stakeholders so that they can give their feedback at any time. The stakeholder meeting witnessed participation from all the society and attended by men and women from nearby villagers who expressed their full support to the project activity. The queries of stakeholders were addressed adequately and were resolved satisfactorily. Finally the meeting concluded with vote of thanks. Thus continuous input and Grievance Mechanism has been followed during physical consultation.

Also during second consultation (online SFR process), the information about Input and Grievance mechanism is being provided to Local Stakeholders (initiated on 28<sup>th</sup> March 2019 and ended on 28<sup>th</sup> May 2019) and feedback was being requested, however no any comments or feedback had been received during the same period. The sustainable monitoring parameters, safeguarding principle justification (through GS4GG PDD) has been provided to stakeholders during SFR process and feedback had been requested. For local people, again notice was being put at project site/nearby village and feedback was being requested.

Thus the requirement of "GS4GG Gold Standard for the Global Goals Stakeholder Consultation & Engagement Procedure, Requirements & Guidelines" has been followed by the project activity.

The PP also placed a grievance register onsite where the stakeholder can put down his/her complain and the same if found genuine will be addressed immediately.

### **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 was being initiated after the listing of the project activity at GS4GG.

#### **Stakeholder feedback Round:**

The SFR had been planned for 60 days after listing project with GS. The email was being sent to relevant stakeholders like NGOs, DNA officials, Gold Standard officials along with project documents. As a result email had been sent to relevant stakeholders on 28<sup>th</sup> March 2019 wherein relevant stakeholders had been requested to give their feedback for the project which ended on 28<sup>th</sup> May 2019, however no any comments received during this period.

The process for the SFR is as follows;

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- E mail and Invitations send to relevant stakeholders
- The non technical summary of project activity, draft GS4GG PDD submission to relevant stakeholders, GS Public view section web link.
- Grievance Mechanism Feedback/Questions from Stakeholders
- Answers for questions received from stakeholders during online SFR process.

## Identification of Stakeholders:

The Stakeholder feedback round was being conducted to consider and receive feedback from the possible stakeholders to the project, i.e. NGOs. Apart from these, the stakeholders as identified by Gold standard Board, i.e. Gold standard partnered NGOs in India and DNA of India (MoEF).

## Invitations to Stakeholders:

The Stakeholder feedback round will be done online method. Email invitations were sent to GS partnered NGO's and MoEF. The relevant documents of project activity like GS4GG PDD, project Technical summary were made available during Stakeholder feedback round.

As per GS toolkit, for SFR process physical meeting is not mandatory. Thus online e mail was being sent to NGOs, Govt officials, GS personnel etc.

For local stakeholders, public notice has been put at project site. Also SFR process are mainly to cover the issues raised during local stakeholder consultation and there were no any negative comments raised during initial physical local stakeholder consultation.

Thus public notice put at project site village and requested the feedback for this project activity as a part of SFR was sufficient and meets the requirement as per GS4GG. This public notice covers all local stakeholders for feedback during SFR process. The public notice has mentioned different feedback methods like the grievance register, telephone access, internet access so that local stakeholders can give their feedback for the project activity.

## Continuous input / grievance mechanism expression method

	<b>Method Chosen (include all known details e.g. location of book, phone, number, identity of mediator)</b>	<b>Justification</b>
Continuous Input / Grievance Expression Process Book	Grievance Register to be maintained at office of PP and O&M site office at Project location.	The project activity site office is appropriate publicly accessible location at which local stakeholders can provide their feedback on the project.  This location is also conducive to continuous and regular checks for stakeholder comments.  Also Grievance Register has been kept at PP office so that any stakeholder can give their comments to PP.
Telephone access	Mr. Manish Dabkara, representative of Project Participant is responsible and his mobile number +91 9907534900	For those who are unable to travel to site or are not literate, they may

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	shall be available for any stakeholder to comment.	contact the Project Implementer via telephone.  Persons dialing this telephone number will have access to a Project representative who speaks both English and the national language, Hindi.
Internet/email access	2 email address:  PP representative:  1. manish@enkingint.org  2. Gold Standard:  info@goldstandard.org	Two email id of the project Implementer has been provided for continuous input / grievance for the convenience of stakeholders with internet access.
Nominated Independent Mediator (optional)	No Independent mediator is assigned.  However, Mr. Manish Dabkara, representative of Project Participant has been assigned as the point of contact for all the local issues.	The use of a Nominated Independent Mediator is not being employed. As the use of the process book, telephone and internet will sufficiently capture feedback as necessary.  However a local employee shall be available in case stakeholders have any comments.

## Appendix 1. Contact information of project participants

Organization name	SB Energy Pvt. Ltd
Registration number with relevant authority	-
Street/P.O. Box	5 <sup>th</sup> 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	<a href="mailto:nosingh@sbenergy.com">nosingh@sbenergy.com</a>

## 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