

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



Version 1.1 – August 2017

KEY PROJECT INFORMATION

Title of Project:	120 MW Solar PV Plant by Juniper Green Sigma Private Ltd. in Gujarat
Brief description of Project:	The project activity is a 120 MW solar power project, promoted by Juniper Green Sigma Private Limited. The purpose of the project activity is to generate clean electricity with utilization of solar energy.
Expected Implementation Date:	NA
Expected duration of Project:	25 years
Project Developer:	Juniper Green Sigma Private Limited
Project Representative:	Infinite Solutions
Project Participants and any communities involved:	Juniper Green Sigma Private Limited
Version of PDD:	06
Date of Version:	11/01/2021
Host Country / Location:	India
Certification Pathway (Project Certification/Impact Statements & Products)	Impact statements & products
Activity Requirements applied: (mark GS4GG if none relevant)	Renewable Energy Activity Requirements
Methodologies applied:	ACM0002: Grid-connected electricity generation from renewable sources - Version 20.0
Product Requirements applied:	GS VER
Regular/Retroactive:	Retroactive
SDG Impacts:	1 - SDG 7 Affordable and Clean Energy 2 - SDG 8 Decent Work and Economic Growth 3 - SDG 13 Climate Action
Estimated amount of SDG Impact Certified	1 - SDG 7- 298,072 MWh/year 2- SDG 8 - - Number (employees): 15 persons - Number (Trainings): Minimum 1 training. - The income to all the unskilled workers are made on day to day basis in line with minimum wage requirements. 3- SDG 13- 275,305 tCO ₂ e per annum

SECTION A. Description of project

A.1. Purpose and general description of project

The main purpose of the project activity is to generate electrical energy through sustainable means using solar power resources, the generated green electricity will contribute to climate change mitigation efforts. This project activity is a large scale solar project. Juniper Green Sigma Private Limited is the project investors for this project activity. The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 275,305 tCO₂e per annum, thereon displacing 298,072 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian electricity grid, which is mainly dominated by thermal/ fossil fuel based power plant.

The project activity is the installation of a new grid-connected renewable power plant/unit and this is not a CPA that has been excluded from a registered CDM PoA as a result of erroneous inclusion of CPAs.

The details of the project are mentioned in the table:

Project Investors' Name	Juniper Green Sigma Private Limited
State	Gujarat
Capacity in MW	120
Local Stakeholder Meeting	29/03/2019
PPA	21/05/2019
Prior Consideration of the CDM to UN	09/08/2019 ¹
Start Date (earliest date when the EPC contracts signed with technology supplier for erection)	04/03/2020
Stakeholders Feedback Round	12/08/2020, 13/08/2020 & 14/08/2020
Commissioning	Expected to be commissioned in Jan' 2021

The locations of the project are mentioned in the table:

Project Investors' Name	Capacity in MW	Village/Taluka	District
Juniper Green Sigma Private Limited	35 MW	Village – Babsar, Taluka – Vadali	Sabarkantha
	40 MW	Village – Bhordu Taluka – Tharad	Banaskantha
	45 MW	Village – Bilvania and Vatakasuka Taluka – Dhansura	Aravali

The project is pursuing GS-VER; however, the PP has also submitted prior consideration to UN on 09/08/2019 and may apply for CDM once the project receives Host Country Approval.

Project activity is being implemented by Juniper Green Sigma Private Limited and is represented by Infinite Solutions.

Scenario existing prior to the implementation of the project activity

As the project activity is the installation of a new grid-connected renewable power plant/unit. The scenario existing prior to the implementation of project activity 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” (Version 7.0, EB 100 annex 4).

Baseline Scenario

Baseline scenario and Scenario existing prior to the implementation of the project activity are both same.

Sustainable Development

The National CDM Authority (NCDMA), which is the Designated National Authority (DNA) for the Government of India (GOI) under the Ministry of Environment, Forest and Climate Change (MoEFCC), has mentioned four indicators for the sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects from India. The project's contribution towards sustainable development has been addressed based on the following sustainable development aspects, in line with the requirements of the NCDMA:

- ***Social well being***

The project activity will provide job opportunity to local people during erection, commissioning and maintenance of the Solar power project. Frequency of visiting to villages and nearby areas by skilled, technical and industrialist has increased due to installation /site visit/operation and maintenance work related to the project at plant site. This directly and indirectly positively effects the economy of nearby populace.

- ***Environmental well being***

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

- ***Economic well being***

- ✓ This scheme will help ease the problems of electric supply in the agricultural sector - especially to run the agro-feeders. The main target is to provide power at least 12 hours a day.
- ✓ Since the prices of the electric supply system are cheaper, the farmers will be able to use them as production units at lesser costs. Hence it will boost the agricultural produce.
- ✓ At present the farmers suffer because there is an issue of interruption in agricultural works due to power cuts. This problem will be readily addressed when this scheme comes into effect.
- ✓ The agricultural workers will have an extra source of income from the land they are renting out for this purpose.

- ***Technological well being***

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

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:

¹ https://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html

Eligibility Criteria Category	Description	Justification	Criterion met?
Types of Project	The project type is a large scale Solar Power Plants which generates power using Solar Energy. The project activity belongs to the type of Renewable energy that generate and deliver power to the Indian grid. The project applies methodology ACM0002 Version 20, which is an approved methodology under Gold Standard.	The Solar Power Plant Project is conceived as a grid connected large solar power plant within the category of renewable energy supply. See section A.1.	Yes
Location of Project:	The project activity is located in the below location in SabarKantha, Banaskantha and Aravalli district of Gujarat with an installed capacity of 120 MW. Further details have been provided in section A.4 of this report.	The Power purchase agreement between Juniper Green Sigma Private Ltd & Gujarat Urja Vikas Nigam Ltd. (GUVNL). It has been submitted to the DOE.	Yes
Project Area, Project Boundary and Scale:	Project Area and Boundary are defined in line with the applicable Methodologies ACM0002. The project activity includes 120 MW installed capacity and is greenfield large solar power plants with an installed capacity above or equal to 15MW to be qualified as a large scale solar plant (in accordance with UNFCCC rules).	The Project is located at Villages of SabarKantha, Banaskantha and Aravalli district of Gujarat. The ESIA and the land documents has been submitted to the DOE. The project has an installed capacity of 120 MW which is more than 15 MW, therefore applies as a Small-Scale project. See section A.1	Yes
Host Country Requirements:	The project activity follows the Social well being, Environmental well being, Economic well being and Technological well being.	Projects is in compliance with India's legal, environmental, ecological and social regulations. The Third Party Environment and Social Impact Assessment Report has been submitted to the DOE.	Yes
Contact Details:	Project Participant: Juniper Green Sigma Private Limited Name of the contact person: Mr. Ankush Malik Email: ankush.malik@junipergreenenergy.com	GS4GG-Cover Letter	
Legal Ownership and Other Rights:	The project activity is being developed by Juniper Green Sigma Private Limited.	The PPA is in the name of the Juniper Green Sigma Private Limited and has been submitted to the DOE.	Yes
Official Development Assistance (ODA) Declaration:	The project had private funding and funding from bank. The PP hereby confirms that there is no public funding from Annex 1 countries and no diversion of Official Development Assistance (ODA) involved in the project activity.	The Project Owner declares that the project has not directly or indirectly received or benefited from official development assistance. An ODA declaration (i.e. GS Annex D) has been submitted to DOE.	Yes

- The project applies methodology ACM0002, which is an approved methodology under Gold Standard.

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- The project type is solar 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 project is 120 MW hence is large scale project activity.
- The project area is at villagenear Sabarkantha, Banaskantha and Aravali district of Gujarat.
- The project boundary includes the Solar Project activity, sub-station, grid and all power plants connected to grid. The proposed project activity will evacuate power to the Indian grid.
- The Project is not included in any other voluntary or compliance standards programme and the project demonstrate that there is no double counting of impacts at design and performance certification.
- Projects is in compliance with India's legal, environmental, ecological and social regulations.
- 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 projects are an approved project type and do not require further 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 Renewable Energy Activity Requirements

Project Type : As discussed above, the project type is eligible.

Project Location : The project is located in India.

Project scale : The project activity is a 120 MW solar 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

The project participants have received Evacuation Approvals from Gujarat Urja Vikas Nigam Limited (GUVNL); also the Power Purchase Agreement demonstrating the PP as the legel owner has already been signed with GUVNL. Thus the project participants Juniper Green Sigma Private Limited is the legal owners of the project and have the legal rights for the credits that shall be generated by this project activity.

A.4. Location of project

A.4.1. Host Country

India

A.4.2. Region/State/Province etc.

Gujarat

A.4.3. City/Town/Community etc.

Villages: Vantda suka, Bilvaniya, Babsar and Bhordu

District: Sabarkantha, Banaskantha and Aravali

State: Gujarat, India

A.4.4. Physical/Geographical location

The proposed project activity is located at Sabarkantha, Banaskantha and Aravali district in Gujarat. The geographical coordinates of the project site have been provided below:

Geo-coordinates	Location	Degree-minute-second
Latitude	Sabarkantha	23°43'44.3"N
Longitude		72°58'07.9"E
Latitude	Banaskantha	24°18'28.3"N
Longitude		72°21'06.0"E

Latitude	Aravali	23°49'06.7"N
Longitude		73°08'39.7"E

A pictorial representation of the location of the project activity on the map of India is provided as follows:



A.5. Technologies and/or measures

The project activity involves installation of 120 MW grid connected solar photovoltaic power plant. The PV system will mainly consists of PV modules, module mounting structures, inverters, regulators, monitoring devices etc.

Electrical Characteristics are as below:

- 3-phase alternating current
- Nominal frequency is 50 Hz
- Final Voltage at Delivery Point is 400/220/132/66kV

The project activity is expected to operate at a plant load factor of 28.36% exporting 298,072 MWh of electrical energy to the Regional grid of India, throughout its entire life span of 25 years. This will result in average annual reduction of 275,305 tCO₂ per annum from the project activity. The project activity does not involve any technology transfer.

Baseline Scenario

As the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following as per applied methodology: *“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”.*

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

Purpose of the Project

The purpose of the project activity is to generate electrical power using solar energy, thereby displacing non-renewable fossil resources resulting in sustainable, economic and environmental development. In the absence of the project activity equivalent amount of power generation would have taken place through fossil fuel dominated power generating stations. Thus the renewable energy generation from project activity will result in reduction of the greenhouse gas emissions.

Positive contribution of the project to the following Sustainable Development Goals:

1. **SDG13: Climate Action** : The project would lead to reduction of approx 275,305 tCO₂ per annum due to implementation of project activity.
2. **SDG 7: Affordable and Clean Energy** : The project is expected to generate 298,072 MWh of clean energy per annum
3. **SDG 8: Decent Work and Economic Growth** : The project is expected to provide direct employment to around 15 persons. The project leads to Trainings & workshops which are conducted for the O&M staff of the PP.

A.6. Scale of the project

Renewable energy project activities with a maximum output capacity of 15 megawatts (or an appropriate equivalent) are small scale project activity and project activities of more than 15 MW are considered as large-scale CDM project activity.

As the project activity is of 120 MW capacity, hence clearly it is Large Scale project.

A.7. Funding sources of project

Private funding and funding from bank. The PP hereby confirms that 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

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, para 13(i) “*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 being a renewable energy project is not gender sensitive project. The project does not adversely impact women or 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 Women²” and the project has aligned its 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 <http://hrlibrary.umn.edu/research/ratification-india.html>

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2. *Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?* No, the Project beneficiaries in terms of employment and social upliftment of the area are common for both the gender.
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 that are planned to be carried out by the project proponent shall be discussed with the community, consisting both the genders, before the actual implementation.
4. *Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?* Yes the project takes into account gender roles and abilities of women/men. Job profile is allocated based on the type of work to be carried out.
5. *Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?* No, on the contrary the project leads to increased availability of electricity in the regional grid thereby uplifting the living standards.
6. *Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?* No, since the project is a renewable 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 leads to improved electricity in the regional grid thereby leading to less usage of fuel for lighting.
8. *Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?* No, in fact, due to improved electricity availability the usage of fuel for lighting would be reduced as well as indoor air quality would be improved.

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

Response: Since the project is applying retroactively for GS registration, a Stakeholder Feedback round shall be carried out at a later stage. However, a stakeholder consultation was conducted in line with CDM requirements on 29/03/2019 at the site location. The project representative explained how such power projects help in providing clean energy and thereby help in mitigating impacts due to Global Warming and the impacts of solar power projects which lead to providing clean energy, increase in employment opportunities both long term and short term, increased income and thereby leading to improvement in living standard of the people. The stakeholders shared full support for the solar power project operations.

No negative comments were received.

Moreover, the Stakeholder Feedback Round has been conducted in village Dhansura of Aravali district on 13th July 2020, in Babsar village of Sabarkantha district on 14th July 2020 and in village Bhordu of Banaskantha district on 15th July 2020.

The stakeholders from all categories suggested by Gold standard were invited to the meeting, the same has been documented as per the guidelines. Section 4.1.5 under Stakeholders Consultation Requirement states that "The invitation for the consultation meeting shall be given at least 30 days before the meeting takes place" therefore the invitation Email was sent to the GS nominated NGO stakeholders on 12/06/2020 i.e. 30 days before the meeting held.

According to the requirement of "GS4GG Gold Standard for the Global Goals Stakeholder Consultation & Engagement Procedure, Requirements & Guidelines" Stakeholder Feedback Round has been conducted at the

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project site which was attended by local stakeholders. The expert stakeholders have been intimated for the SFR round and along with the invitations they were provided with a public link where all the project related documents are available. All the documents have been made available to public through website <http://infisolutions.org/services/carbon-mgt-services/gs-7572/> for 2 months i.e. from 30/05/2020 to 29/07/2020 for stakeholders to review and comment. They were free to comment either online or during the actual SFR meeting. There were no negative comments from the stakeholders through any means of communication channels (E mails, Phone calls, Grievance Register available at the project site). The documentation is available permanently to stakeholders at project site & company's website.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

Title : Grid-connected electricity generation from renewable sources.
References : Approved Large Scale Consolidated Methodology: ACM0002 “Grid-connected electricity generation from renewable sources” Version 20.0

Tools: Tool for the demonstration and assessment of additionality 7.0
<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.pdf>
 Tool to calculate the emission factor for an electricity system 7.0
<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

B.2. Applicability of methodology

As per ACM0002 (Version 20.0, EB 105 Annex 3), “*This methodology applies to project activities that include retrofitting, rehabilitation (or refurbishment), replacement or capacity addition of an existing power plant or construction and operation of a Greenfield power plant*”. The project activity meets the applicability conditions of the approved consolidated baseline and monitoring methodology ACM0002, Version 20.0, Sectoral Scope 1 for Greenfield projects as described below:

Applicability	Project activity vis-à-vis applicability Conditions
This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (a) Involve a capacity addition to (an) existing plant(s); (b) Involve a retrofit of (an) existing operating plants/units; (c) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (d) Involve a replacement of (an) existing plant(s)/unit(s).	The project activity is installation of a new grid connected solar power plant/ unit at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable.
The methodology is applicable under the following conditions: (a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; (b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken	The proposed project activity is an installation of a new grid connected solar power plant/ unit and hence criteria under point (a) is met. The project does not involve any capacity additions, retrofits or replacements and therefore this criteria under point (b) is not applicable.

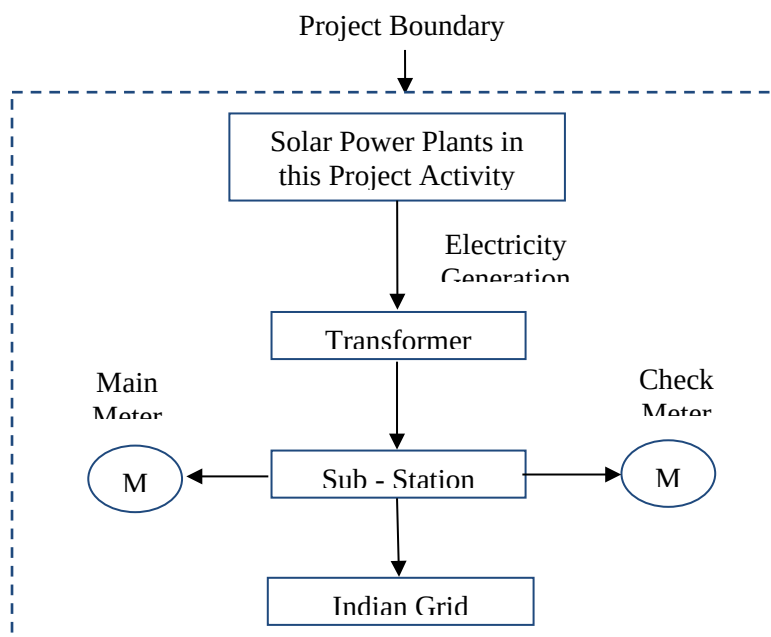
between the start of this minimum historical reference period and the implementation of the project activity.	
In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (3), is greater than 4 W/m^2; or (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m^2; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m^2, all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m^2; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m^2 shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	The proposed project activity is an installation of a new grid connected solar power plant/ unit and not Hydro power plant, therefore this criteria is not applicable for this project activity.
In the case of integrated hydro power projects, project proponent shall: • 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 • Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	The proposed project activity is an installation of a new grid connected solar power plant/ unit and not Hydro power plant, therefore this criteria is not applicable for this project activity.
The methodology is not applicable to: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; (b) Biomass fired power plants/units.	The project activity is installation of a new grid connected solar power project/ unit and does not involve switching from fossil fuel to renewable energy, therefore criterion described in point (a) is not relevant to the project activity. This is a solar power plant/ unit and not a biomass fired plant, therefore criterion described in point (b) is not applicable to the project activity.

In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.	The project activity is a new grid connected solar power plant/ unit and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity.
Applicability conditions of “Tool to calculate the emission factor for an electricity system”, - Version 7.0	
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).	This condition is applicable. OM, BM and CM are estimated using the tool under section B.6.3 for calculating baseline emissions.
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: be met. Namely, the total capacity of off-grid Procedures related to off-grid power generation” should 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.	Since the project activity is grid connected, this condition is applicable and the emission factor has been calculated accordingly.
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.	The project activity is located in India, a non-Annex I country. Therefore, this criterion is not applicable for the project activity.
Under this tool, the value applied to the CO2 emission factor of biofuels is zero.	The project activity is a grid connected solar power project/ unit and does not involve emission from biofuels. Therefore, this criterion is not applicable.

B.3. Project boundary

Project boundary has ascertained using ACM0002 (Version 20.0, EB 105, Annex 3) - “*The spatial extent of the project boundary includes the project power plant/unit and all power plants/units connected physically to the electricity system that the CDM project power plant is connected to.*”

Hence the project boundary includes the Solar Project activity, sub-station, grid and all power plants connected to grid. The proposed project activity will evacuate power to the Indian grid.



	Source	GHGs	Included?	Justification/Explanation
Baseline scenario	Grid connected electricity generation	CO ₂	Yes	Main emission source
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
Project scenario	Greenfield Solar Power Project Activity	CO ₂	No	No CO ₂ emissions are emitted from the project activity
		CH ₄	No	No, Project Activity does not emit CH ₄
		N ₂ O	No	No, Project Activity does not emit N ₂ O

B.4. Establishment and description of baseline scenario

As per the approved consolidated Methodology ACM0002 (Version 20.0, EB 105, Annex 3) “If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in “ Tool to calculate the emission factor for an electricity system” version 7.0.

The project activity involves setting up of solar plant to harness the power generation from solar radiations 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.

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), in accordance with the Tool to calculate the emission factor for an electricity system – Version 7.0. Calculations for this combined margin must be based on data from an official source (where available) and made publically available. In India, Central Electricity Authority (CEA), Government of India provides this data, and accordingly the same has been used.

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

Parameter	Value	Nomenclature	Source
EF _{grid,CM,y}	0.9419 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Calculated ³ as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 15 published by Central Electricity Authority (CEA), Government of India.
EF _{grid,OM,y}	0.9622 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3 year (2016-17, 2017-18 and 2018-19) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 15, published by Central Electricity Authority (CEA), Government of India.
EF _{grid,BM,y}	0.8811 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	Baseline CO ₂ Emission Database, Version 15, published by Central Electricity Authority (CEA), Government of India.

B.5. Demonstration of additionality

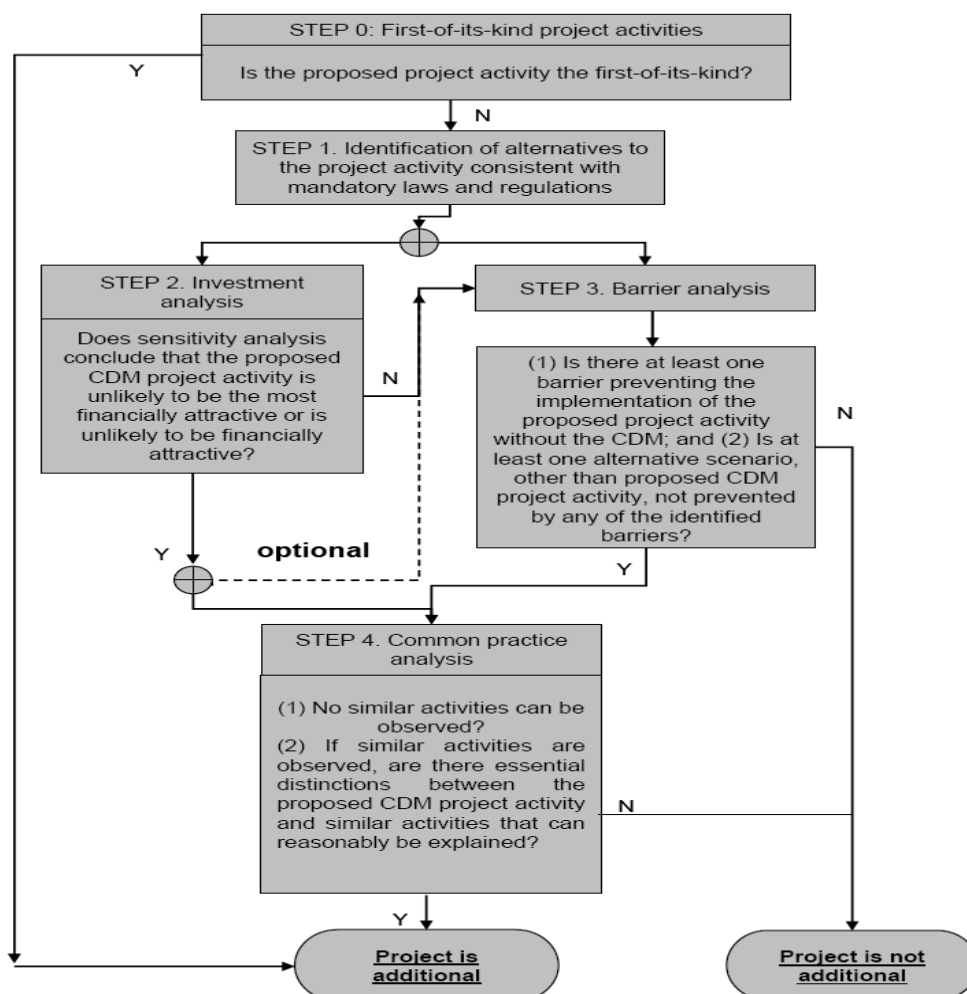
The table below is only applicable if the proposed project is deemed additional, as defined by the applied approved methodology or activity requirement or product requirement.

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 proposed 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, EB 105, Annex 3).

Thus the project follows section 5.3.2 of the applied methodology which requires the project proponent to determine the additionality based on “Tool for the demonstration and assessment of additionality”, Version 7.0. The step-wise approach to establish additionality of the project activity has been followed, details of which are provided in the following paragraphs:

³ http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/database_15.zip



Step 0: Demonstration whether the proposed project activity is the first-of-its-kind

The proposed project activity is not the first of its kind. Hence, this step is not applicable.

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

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

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

Step 2: Investment Analysis

Sub-step 2a: Determine appropriate analysis method

As per “Tool for the demonstration and assessment of additionality” (version 07.0.0), for financial analysis of the project, the following three options are available:

Option I: Simple Cost Analysis

Option II: Investment Comparison Analysis

Option III: Benchmark Analysis

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

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

Project Participants have considered Post-Tax Equity IRR for investment analysis at the time of decision-making. As Project Participants 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.

As per Para 15 of EB101, Annex 11 states that Required/expected returns on equity are appropriate benchmarks for an equity IRR. Therefore, the Expected return on equity is considered appropriate benchmark.

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

Default Value Benchmark:

As per para 19 of EB101, Annex 11 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:

Table under the Appendix in EB101, Annex 11 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 9.79%⁴

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

Nominal Benchmark = $\{(1 + \text{Real Benchmark}) * (1 + \text{Inflation rate})\} - 1$

Where:

- Default value for Real Benchmark = 9.79% (as per Appendix of EB101, Annex 11)
- Inflation Rate forecast for by International Monetary Fund (IMF) (as per the World Economic Outlook Database, October 2018)

Benchmark estimation:

Appendix in EB101, 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 IMF = 3.986%⁵

Therefore, Benchmark = 14.17%

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

Key assumptions supporting the financial projections

Details of the project	Value	Source
State where the project is situated	Gujarat	
Total Capacity in AC (MW)	120	As per DPR dated 15.02.2019

⁴ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v9.0.pdf>

⁵ <https://www.imf.org/external/pubs/ft/weo/2018/02/weodata/weorept.aspx?sy=2016&ey=2023&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=90&pr1.y=2&c=534&s=PCPI%2CPCPIPCH%2CPCPIE%2CPCPIEPCH&grp=0&a=>

Total Capacity in DC (MWp)	175.34	As per DPR dated 15.02.2019
Expected Date of Commissioning	30-Nov-20	As per DPR dated 15.02.2019
Life of the plant (Yrs.)	25	As per DPR dated 15.02.2019
PLF (%)	28.36%	As per DPR dated 15.02.2019 in accordance to EB 48 Annex 11
Annual generation (kWh)	298,072,140	Calculated Value
Annual Deration (%)	0.70%	As per DPR dated 15.02.2019
Tariff at decision making (INR/kWh)	2.67	As per DPR dated 15.02.2019
O & M Expenses (INR Mn.)	64.88	As per DPR dated 15.02.2019
Escalation in the operational expenses (%)	5.00%	As per DPR dated 15.02.2019
TOTAL COST (INR Mn.)	5,650.90	As per DPR dated 15.02.2019
Equity Investment (INR Mn.)	1,412.73	As per DPR dated 15.02.2019
Loan Amount (INR Mn.)	4,238.18	As per DPR dated 15.02.2019
Interest rate (%)	10.50%	As per DPR dated 15.02.2019
Loan Tenure (Qtr.)	80	As per DPR dated 15.02.2019
Moratorium Period (Qtr.)	4	
Repayment Period (Qtr.)	76	Calculated Value
Repayment instalments value (INR Mn.)	55.765	Calculated Value
No. of Days Receivables	90	As per DPR dated 15.02.2019
O&M Expenses (Days)	30	As per DPR dated 15.02.2019
Interest on Working Capital Debt	11.25%	As per DPR dated 15.02.2019
Salvage Value (%)	10%	As per Order No. 3 of 2015 of GERC Order dated 18.05.2015, pg 38
IT Depreciation Rate (%)	7.69%	As Per Income Tax , Depreciation rates for power generating units
Income tax rate (%)	34.94%	Calculated Value
MAT (%)	21.55%	Calculated Value

Considering the input values, Equity IRRs is given below:

Project Participants' Name	Equity IRRwithout CDM	Benchmark(Equity IRR)
Juniper Green Sigma Private Limited	8.26%	14.17%

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

Sub-step 2d: Sensitivity Analysis

Addressing Guidance 27 & 28 of EB105, Annex 6, 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 are as follows:

Variation %	-10%	Normal	10%	Breaching Value
PLF	5.82%	8.26%	10.66%	22.30%

O&M	8.63%	8.26%	7.89%	-163.73%
Project Cost	10.52%	8.26%	6.43%	-20.38%
Tariff Rate	5.82%	8.26%	10.66%	22.30%

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

Probability to breach the benchmark:
Sensitivity Parameter 1 : PLF
PLF considered in financials is as per “Guidelines for the reporting and validation of Plant load factors” stated in EB48 Annex116.
Variation in PLF of more than 10% is unlikely to happen as the PLF has been reported as per the Third Party Report based.
Sensitivity Parameter 2 : O&M
The sensitivity analysis reveals that O&M will breach the benchmark at negative values and is hypothetical case. Since the O&M cost is subject to escalation (as evidence by the O&M agreement) and also subject to inflationary pressure, any reduction in the O&M costs is highly unlikely. Hence, the reduction in the O&M cost is highly unlikely.
Sensitivity Parameter 3 : Project Cost
Estimated Project Cost for financial analysis is considered as available at the time of decision making. However, even if we consider the actual cost of the project even then the benchmark is not breached. Moreover the Sensitivity is carried out for +/-10%.
Sensitivity Parameter 4 : Tariff Rate
The tariff is determined by PPA which is fixed for the entire project life of 25 years. Hence, there is no probability to get variation for the same.

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

Stepwise approach for common practice analysis has been carried out as per Methodological tool “Common Practice”, version 03.1 EB84, 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%	60	MW
Capacity of the proposed project activity	120	MW

⁶http://cdm.unfccc.int/EB/048/eb48_repan11.pdf

+50%	180	MW
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Step (2): identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:

- The projects are located in the applicable geographical area;
- The projects apply the same measure as the proposed project activity;
- 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;
- 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;
- The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;
- The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

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

- As the project is located in Gujarat state of India, therefore, projects in the geographical area of Gujarat has been chosen for analysis.
- 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.
- The energy source used by the project activity is solar. Hence, only solar energy projects have been considered for analysis.
- The project activity produces electricity; therefore, all power plants that produce electricity are candidates for similar projects.
- The capacity range of the projects is within the applicable capacity range from 60 MW to 180 MW.
- The start date of the project activity is 4-Mar-2020, i.e. the date of the earliest Purchase Order.

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

N_{solar} = 4⁷

List of projects identified under N_{solar}

S. No.	Name of Solar Power Producer	District	Cap. (MW)	Commissioning Date
1	Gujarat State Electricity Corporation Ltd.(GSECL)	Anand	76.04	4-Jan-19
2	Azure Power Thirty Three Pvt. Ltd.	Aravalli	60	22-Feb-19
3	Azure Power Thirty Three Pvt. Ltd.	Sabarkantha	60.47	7-Mar-19
4	Azure Power Thirty Three Pvt. Ltd.	Bhavnagar	75.09	17-Mar-19

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

CDM project activities, which have got registered or are under validation have been excluded in this step. The list of the power plants identified is as below:

S. No.	Name of Solar Power Producer	District	Cap. (MW)	Commissioning Date
1	Azure Power Thirty Three Pvt. Ltd.	Aravalli	60	22-Feb-19

⁷ <https://cea.nic.in/wp-content/uploads/2020/04/Plant-wise-details-of-RE-Installed-Capacity-merged.pdf> (Refer pages 97 to 112 under ‘Summary of RE projects commissioned in Gujarat’)

2	Azure Power Thirty Three Pvt. Ltd.	Sabarkantha	60.47	7-Mar-19
3	Azure Power Thirty Three Pvt. Ltd.	Bhavnagar	75.09	17-Mar-19

It is to be noted here that above projects by Azure Power Thirty Three Pvt. Ltd., along with a few other projects, are part of a single larger project of 260 MW (362 MWp)⁸ which were commissioned on different dates. This 260 MW solar project is already registered under CDM⁹. After excluding the registered projects the total number of projects,

Nall = 1

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 Ndiff.

As per the tool on Common Practice, the project activities have been separated from the different technologies on the basis of Investment climate on the date of the investment decision.

Hence, projects where this condition is satisfied projects are counted for calculating Ndiff projects.

Ndiff = 1

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

Calculate $F=1-Ndiff/Nall$
 $F = 1-(1/1) = 0$

Outcome of Step 4:

As,

- $F = 0$; is less than 0.2
- $Nall-Ndiff = 0$; is less than 3

As the project activity does not satisfy condition (i) and (ii) both, the proposed project activity is not a “common practice” within a sector in the applicable geographical area.

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

Project Timelines	Date
Local Stakeholder Meeting Invitation	20-March-2019
Local Stakeholder Meeting	29-March-2019
PPA	21-May-2019
Date of Notification to CDM EB & NCDMA	09-August-2019

Demonstration of Parallel and continuing actions

As per rule update by Gold Standard dated 22-Jan-2015, “In order to be eligible under Gold Standard a retroactive project must submit the required documents to Gold Standard (time of first submission) within one year of its start date”. Start date of the project activity is 4-Mar-2020. The GS documents were uploaded on

⁸ Page 20 of <http://investors.azurepower.com/~media/Files/A/Azure-Power-IR/documents/events/q4-2019-earnings-call/apgl-4q19-earnings%20presentation.pdf>

⁹ https://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/DG9R3B20T8OLSK46I7EU1NJYCVZQXM/view

the SustainCert on 20-September-2019. Thus, all GS documents were submitted to GS within 1 year of project start date.

Moreover, CDM Project Standard Version 09.0, Section 6.5 states that “For a proposed CDM project activity with a start date on or after 2 August 2008, project participants shall inform the host Party’s designated national authority (DNA) and the secretariat of their intention to seek CDM status in accordance with the Project cycle procedure”.

In line with the above guidance, all the project investors have intimated the UNFCCC and host party DNA i.e. National CDM Authority (NCDMA) of its intention to seek CDM for the proposed project activity in a defined F-CDM form within 180 days (refer table below). Hence, it can be clearly established that CDM was also seriously considered in the decision to proceed with the proposed project activity.

Project Participants’ Name	Start date	F-CDM Date
Juniper Green Sigma Private Limited	4-Mar-2020	09-August-2019

B.6. Sustainable Development Goals (SDG) outcomes

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

Item	Goals and Targets	Indicators
SDG 7: Affordable and Clean Energy	7.2: By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1: Renewable energy share in the total final energy consumption
	Target: 298,072 MWh per annum	
SDG 8: Decent Work and Economic Growth	8.6: 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	8.6.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities
	Target: • Training: 1 nos annually • Employment of 15 staff	
SDG 13: Climate Action	13.2: Integrate climate change measures into national policies, strategies and planning	13.2.1: Number of countries that have communicated establishment or operationalization of an integrated policy/ strategy/ plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)
	Target: 275,305 tCO ₂ per annum	

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

The company shall conduct regular surveys during construction as well as O&M phases in the villages near project locations to check the requirement of facilities by the villages. Based on the surveys, PP shall identify and works on several scope(s) of developmental activities such as health camps, distribution of furniture &

sports kits in schools, toilet requirements in government schools, drinking water requirements etc. For this project activity, following SDGs are expected to be impacted:

SDG 7 : Affordable and Clean Energy

The baseline for the project is no project, thus leading to generation in the relevant grid which is dominated by fossil fuel. The clean energy generated by the project is calculated based on the amount of electricity generated by the project per annum. The project is expected to generate 298,072 MWh of clean energy per annum.

SDG 8: Decent Work and Economic Growth

The project leads to Trainings & workshops which are conducted for the O&M staff of the PP. It is expected that a minimum of 1 training (either of the above) would be carried out annually.

The project will also provide employment to approximately 15 persons including O&M staff, management, outsourced jobs as well as security guards during the O&M phase.

SDG13 : Climate Action :

The project leads to mitigation of 2 275,305 tCO₂ per annum.

As per the approved consolidated Methodology ACM0002 (Version 20.0, EB 105, Annex 03), Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year y (t CO₂e/yr)

BE_y = Baseline emissions in year y (t CO₂/yr)

PE_y = Project emissions in year y (t CO₂e/yr)

Baseline Emissions:

Baseline Emissions for the amount of electricity supplied by project activity, BE_y is calculated as

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

Where:

BE_y = Baseline emissions in year y (t CO₂/yr)

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

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO₂/MWh)

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for

- Greenfield plants,
- Retrofits and replacements, and
- Capacity additions

The project activity is the installation of solar projects and it is a green field project. So the formula in option (a) i.e., greenfield plants is used to calculate the value of $EG_{PJ,y}$. In accordance with para 44 of the applied methodology:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

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

$EG_{\text{facility},y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

The proposed project activity falls under Indian grid, which constitutes of both fossil fuels and non-fossil fuels sources of electricity generation. Emission reductions due to the project activity are considered to be equivalent to the baseline emissions, since the solar project would not lead to any project emission and leakage emissions. Emission reductions are related to the electricity exported by the project and the emission coefficient of the grid system.

Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin and build margin factors according to the procedures prescribed in the latest tool for calculating the emission factor for an electricity system. The steps of calculation are as follows:

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, all the 5 zones have been synchronized and called as Indian Grid.

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

Option I is opted for the project activity i.e. only grid connected power plants are included in the calculation.

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

According to the tool, the calculation of the operating margin emission factor is based on one of the following methods:

- Simple OM; or
- Simple adjusted OM; or
- Dispatch data analysis OM; or
- Average OM.

Any of the four methods can be used for calculating OM. However, the simple adjusted OM and dispatch data analysis OM cannot be currently applied in India due to lack of necessary data however, the simple OM method (option a) can only be used if low cost/must-run resources constitute less than 50% of total grid generation in:

- average of the five most recent years, or
- based on long-term averages for hydroelectricity production.

The Share of Low Cost / Must-Run (% of Net Generation) in the generation profile of the different grids in India in the last five years is as follows:

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)					
	2014-15	2015-16	2016-17	2017-18	2018-19
Indian Grid	16.8%	15.1%	14.6%	14.3%	14.5%

Source: CO2 Baseline Database for the Indian Power Sector - Central Electricity Authority (CEA)

The CEA database uses the option A i.e. data on net electricity generation and CO2 emission factor for each power unit, the average efficiency of each power unit and the fuel type(s) used in each power unit, to calculate the OM of the different regional grids.

$$EF_{\text{grid,OMsimple},y} = \Sigma (EG_{m,y} \times EF_{EL,m,y}) / \Sigma EG_{m,y}$$

Where:

$EF_{\text{grid,OMsimple},y}$: Simple operating margin CO2 emission factor in year y (tCO2/MWh)

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$EG_{m,y}$: Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
 $EF_{EL,m,y}$: CO₂ emission factor of power unit m in year y (tCO₂/MWh)
 m : All power units serving the grid in year y except low-cost / must-run power units
 y : The relevant year as per the data vintage chosen in step 3

In India, the Central Electricity Authority (CEA) has estimated the baseline emission factor for the power sector. This data has also been endorsed by the DNA and is the most authentic information available in the public domain.

Following tables shows the simple OM and Net generation¹⁰ respectively for the recent three years:

Simple Operating Margin Emission Factors (t CO ₂ /MWh) (incl. Imports)			
	2016-17	2017-18	2018-19
Indian Grid	0.9636	0.9543	0.9685
Net Generation in Operating Margin (GWh) (incl. imports)			
	2016-17	2017-18	2018-19
Indian Grid	916,278	960,693	995,957

Therefore the 3 years net generation weighted OM average for Indian grid comes out to be 0.9622 tCO₂/MWh

The emission factor of each power unit m has been determined as follows:

$$EF_{EL,m,y} = (\sum FC_{i,m,y} \times NCV_{i,y} \times EF_{CO_2,i,y}) / EG_{m,y}$$

Where:

$EF_{EL,m,y}$: CO₂ emission factor of power unit m in year y (tCO₂/MWh)
 $FC_{i,m,y}$: Amount of fossil fuel type i consumed by power unit m in year y (Mass or volume unit)
 $NCV_{i,y}$: Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)
 $EF_{CO_2,i,y}$: CO₂ emission factor of fossil fuel type i in year y (tCO₂/GJ)
 $EG_{m,y}$: Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
 m : All power units serving the grid in year y except low-cost / must-run power units
 i : All fossil fuel types combusted in power unit m in year y
 y : The relevant year as per the data vintage chosen in step 3

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

The sample group of power units m used to calculate the build margin consists of either:

- The set of five power units that have been built most recently, or
- The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

Project participants should use the set of power units that comprises the larger annual generation. Accordingly, the CEA database calculates the build margin as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation. The build margin emission factor has been calculated ex-ante based on the most recent information available on units already built for sample group m at the time of PDD submission to the DOE for validation. This option does not require monitoring the emission factor during the crediting period.

The build margin emissions factor is the generation-weighted average emission factor of all power units m during the most recent year y for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = (\sum EG_{m,y} \times EF_{EL,m,y}) / \sum EG_{m,y}$$

Where:

$EF_{grid,BM,y}$	Build margin CO2 emission factor in year y (tCO2/MWh)
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	CO2 emission factor of power unit m in year y (tCO2/MWh)
m	Power units included in the build margin
y	Most recent historical year for which power generation data is available

The CO2 emission factor of each power unit m ($EF_{EL,m,y}$) is determined as per the procedures given in step 4 (a) for the simple OM, using option A1 for y most recent historical year for which power generation data is available, and using for m the power units included in the build margin.

Build margin emission factor is calculated, ex-ante as per the most recent data available. So, build margin emission factor for Indian grid for 2018-19 is 0.8811 tCO2/MWh

Step 6: Calculate the combined margin (CM) emission factor ($EF_{grid,CM,y}$)

The emission factor EF_y of the grid is represented as a combination of the Operating Margin (OM) and the Build Margin (BM). Considering the emission factors for these two margins as $EF_{OM,y}$ and $EF_{BM,y}$ then the EF_y is given by:

$$EF_y = EF_{grid,OM,y} * w_{OM} + EF_{grid,BM,y} * w_{BM}$$

Where:

$EF_{grid,BM,y}$	= Build margin CO2 emission factor in year y (t CO2/MWh)
$EF_{grid,OM,y}$	= Operating margin CO2 emission factor in year y (t CO2/MWh)
w_{OM}	= Weighting of operating margin emissions factor (per cent)
w_{BM}	= Weighting of build margin emissions factor (per cent)

According to “Tool to calculate the emission factor for an electricity system” the weights for OM and BM are 0.75 and 0.25 respectively.

Using the values for operating and build margin emission factor provided in the CEA database and their respective weights for calculation of combined margin emission factor, the baseline carbon emission factor (CM) is 0.9419 tCO2e/MWh.

Project Emission

As per the ACM0002 ver-20.0, Project Emission for most renewable energy power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

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

Where:

PE_y	= Project emissions in year y (tCO2e/yr)
$PE_{FF,y}$	= Project emissions from fossil fuel consumption in year y (tCO2/yr)
$PE_{GP,y}$	= Project emissions from the operation of geothermal power plants due to the release of non condensable gases in year y (tCO2e/yr)
$PE_{HP,y}$	= Project emissions from water reservoirs of hydro power plants in year y (tCO2e/yr).

The project activity involves the generation of electricity from the installation of solar projects. Hence, as per ACM0002, Version 20.0, there is no project emission for solar projects. Therefore, project emissions are zero.

Leakage Emissions

No leakage emissions are considered in the project activity. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). Since the emissions sources are small, it is neglected.

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

Relevant SDG Indicator	SDG13.2.1 : Climate Action
Data/parameter	EF _{OM,y}
Unit	tCO ₂ e/MWh
Description	Operating Margin Emission Factor of Indian Grid
Source of data	Calculated from CEA database, Version 145, Dec 2019 ¹⁰
Value(s) applied	0.9622
Choice of data or Measurement methods and procedures	The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 7.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Relevant SDG Indicator	SDG13.2.1 : Climate Action
Data/parameter	EF _{BM, y}
Unit	tCO ₂ e/MWh
Description	Build Margin Emission Factor of Indian Grid
Source of data	Calculated from CEA database, Version 7
Value(s) applied	0.8811
Choice of data or Measurement methods and procedures	Calculated as per “Tool to calculate the emission factor for an electricity system,”. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 7.0, published by the Central Electricity Authority, Ministry of Power, Government of India. http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver7.pdf
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Relevant SDG Indicator	SDG13.2.1 : Climate Action
Data/parameter	EF _{CM, y}
Unit	tCO ₂ e/MWh
Description	Combined Margin Emission Factor of Indian Grid
Source of data	Calculated from CEA database, Version 07 http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver7.pdf
Value(s) applied	0.9419
Choice of data or Measurement methods and procedures	Calculated as per “Tool to calculate the emission factor for an electricity system,”. The data is obtained from “CO ₂ Baseline Database for Indian Power Sector” version 15.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	-

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

SDG 7: Affordable and Clean Energy - Project expected to generate 298,072 MWh clean energy every year

SDG 8: Decent Work and Economic Growth - Minimum 1 training to be carried out annually, apart from providing employment to approximately 15 persons.

SDG13 : Climate Action - The project leads to mitigation of 275,305 tCO₂ per annum.

Calculation of Outcome for SDG13 : Climate Action

Baseline emissions

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

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

Where,

$EG_{PJ,y}$ = Total quantity of net electricity delivered to the Indian grid.

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y
= 0.9419 t CO₂/MWh.

Project Participant	Capacity	PLF (%)	Degradation Factor	Generated Power (MWh/year)	Baseline Emission Factor (tCO ₂ /MWh)	Baseline emissions (tCO ₂ / year)
Juniper Green Sigma Private Limited	120 MW	28.36%	0.7% annually	298,072	0.9419	275,305

$$BE_y = 298,072 * 0.9419 \text{ t CO}_2/\text{year} = 275,305 \text{ tCO}_2/\text{year}$$

Project emissions

$$PE_y = 0$$

Leakage

No leakage emissions are applicable.

Emission reductions

$$ER_y = BE_y - PE_y = 275,305 - 0 = 275,305 \text{ tCO}_2/\text{year}$$

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

SDG 7: Affordable and Clean Energy

Year	Baseline estimate	Project estimate	Net benefit
Year 1	0 MWh	298,072 MWh	298,072 MWh
Year 2	0 MWh	298,072 MWh	298,072 MWh
Year 3	0 MWh	298,072 MWh	298,072 MWh
Year 4	0 MWh	298,072 MWh	298,072 MWh
Year 5	0 MWh	298,072 MWh	298,072 MWh
Total	0 MWh	1,490,361 MWh	1,490,361 MWh
Total number of crediting years			

Annual average over the crediting period	0 MWh	298,072 MWh	298,072 MWh
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The proposed project activity falls under Indian grid, which constitutes of both fossil fuels and non-fossil fuels sources of electricity generation hence in baseline, the affordable and Clean Energy generated was 0. Since the project is a solar energy project, therefore the Affordable and Clean Energy produced by the project is 298,072 MWh per year.

SDG 8: Decent Work and Economic Growth

Year	Baseline estimate	Project estimate	Net benefit
Year 1	0 Training, 0 Jobs	1 Training, 15 Jobs	1 Training, 15 Jobs
Year 2	0 Training, 0 Jobs	1 Training, 15 Jobs	1 Training, 15 Jobs
Year 3	0 Training, 0 Jobs	1 Training, 15 Jobs	1 Training, 15 Jobs
Year 4	0 Training, 0 Jobs	1 Training, 15 Jobs	1 Training, 15 Jobs
Year 5	0 Training, 0 Jobs	1 Training, 15 Jobs	1 Training, 15 Jobs
Total	0 Training, 0 Jobs	5 Trainings, 15 Jobs	5 Trainings, 15 Jobs
Total number of crediting years			
Annual average over the crediting period	0 Training, 0 Jobs	1 Training, 15 Jobs	1 Training, 15 Jobs

There was no training in the baseline however the training and jobs generated by the project activity is 1 and 15 jobs.

SDG13 : Climate Action

Year	Baseline estimate	Project estimate	Net benefit
Year 1	280,754 tCO2	0 tCO2	280,754 tCO2
Year 2	276,836 tCO2	0 tCO2	276,836 tCO2
Year 3	274,899 tCO2	0 tCO2	274,899 tCO2
Year 4	272,974 tCO2	0 tCO2	272,974 tCO2
Year 5	271,063 tCO2	0 tCO2	271,063 tCO2
Total	1,376,526 tCO2	0 tCO2	1,376,526 tCO2
Total number of crediting years			
Annual average over the crediting period	275,305 tCO2	0 tCO2	275,305 tCO2

The proposed project activity falls under Indian grid, which constitutes of both fossil fuels and non-fossil fuels sources of electricity generation hence in baseline, the estimated emission is 275,305 tCO2 per year. Since the project is solar energy project, therefore the project does not emit any GHG.

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Relevant SDG Indicator	SDG 7.2.1 : Affordable and Clean Energy
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Data / Parameter	$EG_{\text{facility},y}$
Unit	MWh
Description	Quantity of net electricity supplied to the grid
Source of data	Statement of net export of power to the grid at the plant site
Value(s) applied	298,072 MWh
Measurement methods and procedures	The net energy exported to the grid is measured every month using calibrated energy meter by the State Electricity Board authorities in the presence of the project implementer. The meter/s shall be jointly inspected, and sealed by authorised representatives of the company and the state utility. <u>Measuring procedure:</u> Will be measured by an export-import energy meter. The net electricity exported by the project plant would be calculated by deducting the amount of imported electricity from the total amount of exported electricity. <u>Accuracy class of energy meter:</u> 0.2S <u>Entity responsible:</u> JGSPL
Monitoring frequency	Monthly
QA/QC procedures	The meters will be calibrated once in every 3 years by an independent testing laboratory. Calibration records will be maintained at the plant. Data would be cross-verified against sold electricity figure in the joint meter reading statement issued by the Gujarat Urja Vikas Nigam Limited (GUVNL). It is to be noted that the meter in question shall be in control and supervision of GUVNL and shall be calibrated only as and when GUVNL so desires. The metering system comprises of main and check meter. In the event that the main metering system is not in service due to maintenance, repair or testing, the reading shall be obtained from the check meter.
Purpose of data	The Data/Parameter is required to calculate the baseline emission
Additional comment	Data will be archived electronically for a period of 2 years beyond the end of crediting period.

Relevant SDG Indicator	SDG 8.5.1: Decent Work and Economic Growth
Data / Parameter	- Quantitative employment, - Quality of employment - Income generation
Unit	- Number(Trainings) - Number (employees) - INR (salary)
Description	- Number of Trainings provided to employees & O&M staff - Number of project employees with Number of male/female, permanent/temporary, age and person with disabilities. - Salary given to the employees of the project. The income to all the unskilled workers are made on day to day basis in line with the minimum wage requirements. Annual records of income paid to all the employees would be available.
Source of data	Training Records (HSE & HR) Salary Slip of the project employees.

Value(s) applied	The trainings & workshops will be given to the O&M staff are: • HSE Training Record • Soft Skill Training It is expected that a minimum of 1 training (either of the above) would be carried out annually. The training programmes help in making the workforce efficient and skilled at their job. This not only helps the company but adds to growth of individual employees. Thus, the project has a positive impact on the parameter.
Measurement methods and procedures	• Training Attendance sheets. • Employee Records • Salary slip of the employees
Monitoring frequency	Once in a Monitoring period
QA/QC procedures	The number of persons employed would be mentioned in the plant register, which can be crossed checked with daily attendance register. Salary slip can be checked for earnings of employees
Purpose of data	Continuation of regular trainings/workshops for employees & O&M staff
Additional comment	-

Relevant SDG Indicator	SDG13.2.1 : Climate Action
Data / Parameter	Air quality
Unit	tCO2
Description	Reduction in CO2 emission reduction due to implementation of project activity
Source of data	Calculated as per “Tool to calculate the emission factor for an electricity system,”. The data are obtained from “CO2 Baseline Database for Indian Power Sector” version 15.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) applied	275,305 tCO2 emission reductions estimated per annum
Measurement methods and procedures	Calculated from CEA database and Energy Generation
Monitoring frequency	The meters will be calibrated once in every 3 years by an independent testing laboratory.
QA/QC procedures	Calibration records will be maintained at the plant. Data would be cross-verified against sold electricity figure in the joint meter reading statement issued by the Gujarat Urja Vikas Nigam Limited (GUVNL). It is to be noted that the meter in question shall be in control and supervision of GUVNL and shall be calibrated only as and when GUVNL so desires. The metering system comprises of main and check meter. In the event that the main metering system is not in service due to maintenance, repair or testing, the reading shall be obtained from the check meter.
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be archived for crediting period+2 years

Relevant SDG Indicator	Safeguarding principal 4.3.5:
Data / Parameter	• Hazardous and Non-hazardous Waste
Unit	-
Description	The manufacture, trade, release, and use of hazardous and non-hazardous chemicals and/or materials

Source of data	Plant Records
Value(s) applied	0
Measurement methods and procedures	Manual
Monitoring frequency	Once in a Monitoring period
QA/QC procedures	The waste will be disposed to the waste handlers and the firm will comply with all the local laws for monitoring and disposal.
Purpose of data	Analysis of safeguarding principle
Additional comment	-

B.7.2. Sampling plan

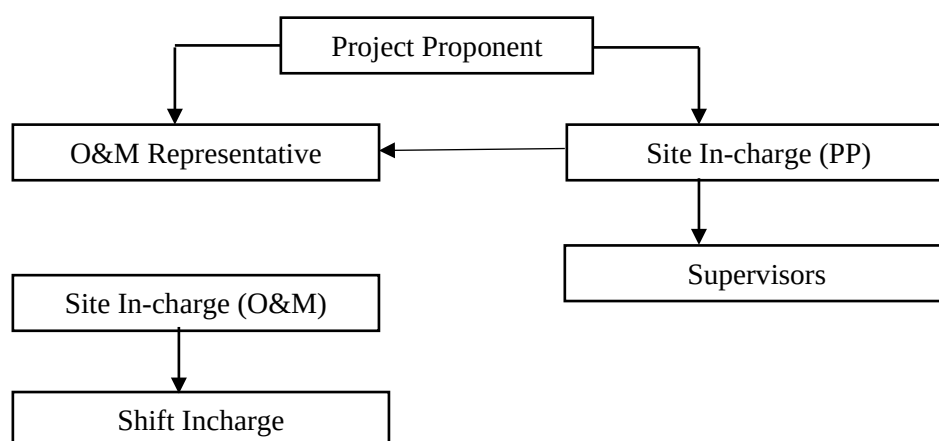
Sampling is not required for the given project activity.

B.7.3. Other elements of monitoring plan

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

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

The monitoring team will composed the following staff:



Responsibilities of Site Incharge (PP): Overall functioning and maintenance of the project activity, the Site incharge shall coordinate with the O&M operator as well as the site supervisors.

Responsibilities of O&M Representative: Co-ordination between Site incharge of the O&M operator as well as the project participant and further report to PP head office.

Responsibilities of Site In-charge (O&M Operator): Responsibility for maintaining the data records, ensures completeness of data, and reliability of data (calibration of equipment) as well as data recording for all the parameters.

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

Data archiving policy: All monitored data will be archived electronically for a period of two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

Data Measurement: The export and import energy will be measured continuously using above mentioned Main and Check meters. Export & Import readings of Main and Check meters shall be taken on monthly basis by authorized officer of Gujarat Urja Vikas Nigam Limited (GUVNL) in the presence of PP or representative of PP. Based on the readings, invoices will be raised by the Project Participant. These invoices can be used for cross checking the meter readings taken for the project activity.

It is to be noted though Project owner or their representatives will be available during meter reading, the calculations of net electricity supplied to grid is completely under purview of SEB and Project Participant does not have any control on it. Moreover, accuracy class of meters and calibration frequency is under purview of SEB and Project Participant does not have any control on it. Project Participant gets the monthly credit report from where net electricity supplied to grid is obtained and used for emission reduction calculations.

Data collection and archiving

Export & Import readings from main and check meters will be collected under the supervision of the O&M Team or authorized representatives of PP. The net electricity supplied to grid would be calculated based on export & import readings. The period of storage of the monitored data will be 2 years after the end of crediting period or till the last issuance of CERs for the project activity whichever occurs later.

Mismatch in Monitoring Period and the Billing Period

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

$$D = (A/B) * C$$

A = Difference of number of days which are not matching of billing period and monitoring period.

B = Number of days of the billing period/ month which was not matched with the monitoring period.

C = Net Electricity supplied to the grid for that given billing period/ month.

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

Emergency preparedness

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

In the unlikely event of failure of both Main meter &/or Check meter installed at sub-station, where both the faulty meters are required to repair or replaced simultaneously, the meters shall be replaced immediately by the spare meter kept available at the site.

Personnel training

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

SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

04-March-2020, i.e. the date of earliest Purchase Order

C.1.2. Expected operational lifetime of project

25 years

C.2. Crediting period of project

C.2.1. Start date of crediting period

09/11/2020 or maximum of two years prior to Gold Standard Design Certification. .

C.2.2. Total length of crediting period

5 years (Renewable twice i.e. 15 years)

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)
3.1 Human Rights	- 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. - The Project shall not discriminate with regards to participation and inclusion.	No	- During construction and operation of the project the project proponent respected all the human rights. The project is not in any kind of conflict with the livelihood of local people. Project proponent had conducted stakeholder's consultation and sought their opinion. - The project will not employ any personnel based on gender, race, religion, sexual orientation or any other basis. As the Constitution of the host country prohibits discrimination on the basis of a person's race, sex, religion, place of birth, or social status. The host country has signed the Convention 100 (equal remuneration) and convention 111	Not Required

			(discrimination in employment /occupation) under the ILO Declaration on Fundamental Principles and rights ¹¹ .	
3.2 Gender Equality and Women's Rights	The Project shall complete the following gender assessment questions in order to inform Requirements, 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? 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)? 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)? 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)? 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? 6. Would the Project potentially reproduce or further deepen discrimination against women based on gender,	No	1. The project does not decrease women's access to or control of resources. 2. No, there is no possibility of adverse effect. 3. No, the Project does not consider gender roles and in fact actively engages both women and men. Community meetings are scheduled considering participation by both Men and Women. 4. The project does not discriminate on basis of gender, caste or religion. 5. No the Project was not designed to increase women's workload nor add care responsibilities. 6. There is no place for discrimination against women in this Project. The project does not discriminate on basis of gender, caste or religion.	Not Required

11 <http://www.mfcindia.org/main/bgpapers/bgpapers2013/am/bgpap2013c.pdf>

	for instance, regarding their full participation in design and implementation or access to opportunities and benefits? 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? 8. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards? The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women. 1. Sexual harassment and/or any forms of violence against women - address the multiple risks of gender-based violence, including sexual exploitation or human trafficking. 2. Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. 3. Restriction of women's rights or access to resources (natural or economic). 4. 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. Projects shall apply the principles of nondiscrimination, equal		7. The Project will not limit women's ability regarding natural resources. The project being solar power project thus does not have any major impact on natural resources of the region. 8. No the Project will not expose women and girls to further risks or hazards. The project proponent has a grievance cell which would look into complaints. 1. There is no such risk for the project. Participation in the project is 100% voluntary. The project proponent has a grievance cell which would look into complaints. 2. The project does not involve in slavery, imprisonment or coercion of women and girls. 3. The Project will not restrict women's rights or access regarding natural resources. The project proponent does not discriminate on gender, caste, religion etc. 4. Marital status is completely irrelevant to the Project. The project proponent does not discriminate on gender, caste, religion etc. Yes, the Project has equal opportunity for women and men to contribute both in volunteer and working positions	
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	treatment, and equal pay for equal work, specifically: 1. 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. 2. Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status. 3. Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks.		1. The project proponent has a stipulated CSR policy, Appointment Policy, Domestic travel policy, Leave Policy and Timekeeping/ Attendance Policy that takes into account participation by both men and women. Further, the CSR projects designed are implemented for equal participation of both men and women. 2. There is no limit on the access to Project participation and benefits from either of these conditions. 3. There are no such conditions that limit the access of women or men for participation. The project is aligned to India's strategy for elimination of all discrimination. India ratified the International Convention on the Elimination of All Forms of Racial Discrimination on 03/12/1968 with certain reservation¹².	
3.3 Community Health, Safety and Working Conditions	The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community.	No	The project is in compliance with all relevant local and national laws. The Project does not threaten human health or environment and does not adversely affect the health of the workers and the community.	Not Required
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	The project does not alter, damage or remove any cultural heritage. As per the list of cultural heritage sites in India by UNESCO ¹³ , it is clear that the project site is not a cultural heritage site.	Not Required

¹² http://nhrc.nic.in/documents/india_ratification_status.pdf

¹³ <http://whc.unesco.org/en/statesparties/in>

3.4.2 Force d Evicti on and Displa cemen t	Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	The project does not involve and is not complicit in involuntary resettlement of peoples in any way. The Project Developer has also obtained all necessary clearances from nodal agencies and NOCs from all the Gram Panchayats for establishing the project.	Not Required
3.4.3 Land Tenur e and Other Rights	1. Does the Project require any change to land tenure arrangements and/ or other rights? 2. For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?	No	The project has all the legal, customary rights on the land and does not require any change to land tenure arrangements. There are no uncertainties regarding land tenure, access rights, usage rights or land ownership. PP have the rights to use land for the project activity as the land has been procured from local land holders by means of lease and obtained required approvals and written consent from the Government and is paying yearly rent for the use of land as per land use deed signed between PP (lessee) and the Land holder (lessor). The lease deeds of the project lands have been submitted to the DOE. The proponent has also obtained necessary clearances from nodal agencies for establishing the plant.	
3.4.4 Indige nous Peopl es	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 a solar power project and it is not located on land/territory claimed by any indigenous peoples. The project is located at the site where there are no any people residing. It is located at barren and dry waste land which is left unused otherwise.. The project location is not nearby the nearest residential area, thus project activity do not have impact on Indigenous Peoples. The ESIA report has been submitted to the DOE for the assessment.	Not Required
3.5 Corru ption	The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	3.5.1. The project is renewable energy technology and does not contribute to or reinforce corruption of any kind. Indulgence in corruption is an illegal activity in the host country and the local labor compliance takes into account of the same. PP does not involve and is not complicit in any kind of corruption. The project abides by the United	Not Required

			Nations Convention Against Corruption. ¹⁴ India has ratified UN convention against Corruption in 2011 ¹⁵ made on 09.05.11.	
3.6.1 Labour Rights	1. The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the International Labour Organization (ILO) fundamental conventions. Where these are contradictory and a breach of one or other cannot be avoided, then guidance shall be sought from Gold Standard. 2. Workers shall be able to establish and join labour organisations. 3. Working agreements with all individual workers shall be documented and implemented. These shall at minimum comprise: (a) Working hours (must not exceed 48 hours per week on a regular basis), AND (b) Duties and tasks, AND (c) Remuneration (must include provision for payment of overtime), AND (d) Modalities on health insurance, AND (e) Modalities on termination of the contract with provision for voluntary resignation by employee,	No	1. Forced labor is an illegal activity in the host country and the local labor compliance takes into account of the same. Further, India is a party to ILO and forced labour is illegal in India. The india have laws in place prohibiting forced and compulsory labor¹⁶. The HR policy of the company has been submitted for the assessment to the DOE. 2. The project respects fundamental right of employee. There is law in India since 1926 by The Trade Unions Act, 1926¹⁷ which protects rights of industrial trade unions and their members. 3. The agreements are in place for permanent employees. The proponent confirms that all the fundamental rights of the employees will be respected. The rights of industrial trade unions and their members have been protected by law in India since 1926 by The Trade Unions Act, 1926. Working agreements with all individual workers are documented and implemented. 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. The project prefers the local employment and culture is maintained at project site.	Not Required

¹⁴ <http://www.unodc.org/unodc/en/corruption/ratification-status.html>

¹⁵ https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtmsg_no=XVIII-14&chapter=18&clang=en#EndDec

¹⁶ <https://labour.gov.in/>

¹⁷ <http://ncw.nic.in/acts/TheTradeUnionsAct1926.pdf>

	AND Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. The Project Developer shall justify that the employment model applied is locally and culturally appropriate. 5. Child labour, as defined by the ILO Minimum Age Convention is not allowed. The Project Developer shall use adequate and verifiable mechanisms for age verification in recruitment procedures. Exceptions are children for work on their families' property as long as: (a) Their compulsory schooling (minimum of 6 schooling years) is not hindered, AND (b) The tasks they perform do not harm their physical and mental development, AND (c) The opinions and recommendations of an Expert Stakeholder shall be sought and demonstrated as being included in the Project design. 6. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.		The country have strict prohibition for child labour¹⁸. Thus project does not involve child labour during construction and operation of project activity. 4. The Project Developer ensures that local workers/employees are preferred, to the extent possible, for employment during construction as well as operation phase of the project ensuring skill development in the local populace. 5. Child labor is strictly prohibited in the country¹⁹. The proponent assures that no child labor will be employed during construction and operation of the plant. The project proponent has a set mechanism to ensure the age of all the temporary/ permanent employees during the life time of the project. 6. The Project Developer has an active HSE team which ensures that all employees are given appropriate equipment and training. The same is properly documented and appropriate measures taken in case of emergencies.	
3.6.2 Negative Economic Consequences	1. The Project Developer shall demonstrate the financial sustainability of the Projects implemented, also including those that will occur beyond the Project Certification period. 2. The Projects shall consider economic impacts and demonstrate a	No	1. Financial Sustainability of the project has been discussed under Section B.5 above. The calculations are for the entire life of the project.	Not Required

¹⁸ https://indianchild.com/child_labour_law_in_india.htm

¹⁹ http://www.indianchild.com/child_labour_law_in_india.htm

	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.		2. There are no negative economic impacts or potential risks to the local economy due to the project activity.	
4.1.1 Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The project is a solar power project and does not lead to any greenhouse gas emissions in project scenario.	Not Required
4.1.2 Energy Supply	Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The project is connected to the grid, as well as being a solar power project it will be a net provider of power to the local grid.	Not Required
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 being a solar power project will not have any such impacts.	Not Required
4.2.2 Erosion and/or water body stability	1. Could the Project directly or indirectly cause additional erosion 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?	No	1. No the Project activity has no effect on soil conditions because it has no waste coming out. 2. The project area is not susceptible to excessive erosion or water body instability.	Not Required
4.3.1 Landscapes 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 and Social Impact Assessment which comprises that the land in the region is semi-arid and sources of water are few. Mostly leguminous plants with low water requirement are grown. Predominant lands do not have any irrigation facilities and there by totally	Not Required

			dependent on rainfall and post-monsoon the land remains dry. Advent of the new solar projects in the region will open the opportunities for utilization of barren and dry waste land which is left unused otherwise.	
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 will not be susceptible to or lead to increased vulnerability to solar, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions.	Not Required
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 does not have any impact by used of GMOs.	Not Required
4.3.4 Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	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 Required
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 during operational phase does not use any type of oil/lubricants, grease which are classified as hazardous.	Not Required
4.3.6 Pesticides and fertilizers	Will the Project involve the application of pesticides and/or fertilisers?	No	The Project will not involve the application of pesticides and/or fertilisers.	Not Required
4.3.7 Harvesting of forests	Will the Project involve the harvesting of forests?	No	The Project does not involve the harvesting of forests.	Not Required
4.3.8 Food	Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration	No	The Project does not have any impact on the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives.	Not Required

	or export or economic incentives?			
4.3.9 Animal Husbandry	Will the Project involve animal husbandry?	No	The Project will not involve animal husbandry.	Not Required
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	Being Solar project, it does not affect or alter largely intact or HCV ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified. It is confirmed that the project is not in the proximity of any critical natural heritage site on the World Heritage list which can be checked in Host country ratification of the World Heritage Convention (1977): http://whc.unesco.org/en/statesparties/ The project has been developed with transparent communication with local communities.	Not Required
4.3.11 Endangered Species	1. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? 2. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	1. The ESIA report details out that there are no endangered species identified as potentially being present within the Project boundary. There are no Rare, Endemic, Endangered and Threatened (REET) species present in the study area (upto 10 sq km). No migratory corridors or breeding grounds for faunal species present here. There are no floral species having economic value of medicinal, timber / fuel wood, fodder and other socio-economic purposes. The study area does not have significant wild life habitat, National Parks, endangered species of flora & fauna or reserved forests. 2. The Project does not impact other areas where endangered species may be present through transboundary affects.	Not Required

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

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

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

The project proponent has invited the local stakeholders through public notice which were displayed to the nearby areas. Further, stakeholders were invited individually to attend the stakeholders meeting. on 20/03/2019. The stakeholders have been invited to share their feedback in person in a meeting held at Surendra Nagar on 29/03/2019.

The local stakeholders 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 LSH meeting and Feedback round along with List of Attendees, copy of Public Notice, invitations etc. will be submitted to the DOE.

Apart from this, Stakeholder Feedback round has been carried out inline with the requirements of Gold Standard process at village Dhansura of Aravali district, village Babsar of Sabarkantha district and village Bhordu of Banaskantha district of Gujarat on 13th, 14th and 15th of July 2020 respectively. Below stakeholders from all categories suggested by Gold standard were invited to the meeting:

1. Local villagers,
2. Community members,
3. O&M operators and employees,
4. Local government bodies,
5. Apart from these the stakeholders as identified by Gold standard Board, i.e. Gold standard partnered NGOs and DNA of India (MoEF) were also invited.

An invitation email was sent to the GS nominated NGO stakeholders on 12/06/2020 i.e. 30 days before the meeting held.

According to the requirement of "GS4GG Gold Standard for the Global Goals Stakeholder Consultation & Engagement Procedure, Requirements & Guidelines" Stakeholder Feedback Round has been conducted at the project site which was attended by local stakeholders. The expert stakeholders have been intimated for the SFR round and along with the invitations they were provided with a public link where all the project related documents are available. All the documents have been made available to public through website <http://infisolutions.org/services/carbon-mgt-services/gs-7572/> for 2 months i.e. from 30/05/2020 to 29/07/2020 for stakeholders to review and comment. They were free to comment either online or during the actual SFR meeting. There were no negative comments from the stakeholders through any means of communication channels (E mails, Phone calls, Grievance Register available at the project site). The documentation is available permanently to stakeholders at project site & company's website. The SFR measured the impact of the project on the Safeguarding principles. The comments from Experts were also identified in line with the GS4GG requirements. They were happy about the project & the benefits they are getting by the project activity.

Further, during the stakeholder feedback round the local villagers and other stakeholders were informed about the continuous input mechanism and contact details were briefed. The grievance book has been placed at PP's office. The book is made available at the PP's office which is accessible to the stakeholders to receive the feedback/complaint of corresponding stakeholder.

E.2. Summary of comments received

The project is submitted to GS under retroactive type as start date of project was prior to first submission of project activity to Gold Standard. The first physical Local Stakeholder Consultation meeting was conducted as per CDM requirement. However this requirement of "GS4GG Gold Standard for the Global Goals Stakeholder Consultation & Engagement Procedure, Requirements & Guidelines" has been followed by the project activity.

The first physical Local stakeholder consultation was carried out by inviting the local stakeholders through public notice. 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, the nearby local villagers are most relevant 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 initial 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. Thus continuous input and Grievance Mechanism has been followed during first physical consultation.

A summary of the comments and queries from the stakeholders are presented below along with the responses from the representatives of the project participants.

The representative of project participant explained about the power generation process from this proposed solar power Plant and emphasised on the positive impacts that this project would leave on the local community via:

Q1: The project will use solar light for energy generation, would there be pollution from the plant?

A1: For the project, the solar energy is renewable source of energy for pollution free electricity generation. Without the use of solar energy for electricity generation, that equal amount of electricity would have been generated by the fossil fuel based power plants in the regional grid.

Q2: I know for power plants, water is required. Is there water requirement for this project?

A2: No, water is not required in this technology based power projects. This shows the water saving opportunity for the region, which would be used during electricity generation by conventional power plants.

Q3: I'm not sure whether the project will have noise problem. Would you please have some introduction of the problem?

A3: There are no such moving parts in this type of technology based power plants, thus there is no noise problem from this power project, at all.

Q4: Will this project fetch the employment opportunities to the local residents?

A4: Yes, this project would generate employment opportunities in the region. Moreover this may attract more companies, to invest in such kind of clean energy generation projects, in this region along with employment opportunities.

The PP also placed a grievance register onsite in 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

There were no negative 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.

Continuous input / grievance mechanism expression method

Methods	Details	Reason for Selection
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Continuous Input/Grievance Expression	Input/Grievance Register to be maintained at project site office.	O&M contractor has a dedicated office for O&M in the project area. Thus it 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. Shailesh Shekhar, an employee of the company is responsible and his mobile number +91-9910509744 shall be available for any stakeholder to comment.	For those who are unable to travel to site or are not literate, they may contact the Project Implementer via telephone. Persons dialing this telephone number have access to a Project representative who speaks both English and the national language, Hindi.
Internet/email access	Email address: Mr. Shailesh Shekhar Email id: shailesh.shekhar@junipergreenenergy.com Gold Standard: info@goldstandard.org	Email id of the project Implementer has been provided for continuous input / grievance for the convenience of stakeholders with internet access.
Nominated Independent Mediator	No Independent mediator is assigned. However, Mr. Shailesh Shekhar 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.

Appendix 1. Contact information of project participants

Organization name	Juniper Green Sigma Private Limited
Registration number with relevant authority	U40100DL2011PTC228318
Street/P.O. Box	Sector 32
Building	Plot No. 18, 1 st Floor, Institutional Area
City	Gurugram
State/Region	Harayana
Postcode	122001
Country	India
Telephone	+91 0124-4739600
Fax	-
E-mail	ankush.malik@junipergreenenergy.com
Website	http://junipergreenenergy.com/
Contact person	Mr. Ankush Malik
Title	Asst. Manager-Renewable Energy
Salutation	Mr.
Last name	Malik
Middle name	-
First name	Ankush
Department	-
Mobile	9810067467
Direct fax	-
Direct tel.	-
Personal e-mail	ankush.malik@junipergreenenergy.com

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