



**Monitoring report form for CDM project activity
(Version 06.0)**

Complete this form in accordance with the instructions attached at the end of this form.

MONITORING REPORT

| | | |
|---|--|-------------------------------------|
| Title of the project activity | 2x50 MW Orange Suvaan Solar Photovoltaic Power Project in Maharashtra, India | |
| GS reference number of the project activity | GS-5928 | |
| Version number of the PDD applicable to this monitoring report | 5.0 | |
| Version number of this monitoring report | 2.0 | |
| Completion date of this monitoring report | 02/07/2019 | |
| Monitoring period number | 01 | |
| Duration of this monitoring period | 16/06/2017 to 30/06/2018 (both days included) | |
| Monitoring report number for this monitoring report | N/A | |
| Project participants | Orange Suvaan Energy Private Limited | |
| Host Party | India | |
| Sectoral scopes | 1: Energy industries (renewable - / non-renewable sources) | |
| Applied methodologies and standardized baselines | ACM0002: Grid-connected electricity generation from renewable sources --- Version 17.0 | |
| Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period | Amount achieved before 1 January 2013 | Amount achieved from 1 January 2013 |
| | NA | 198,191 tCO ₂ e |
| Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD | 171,644 tCO ₂ e | |

SECTION A. Description of project activity

A.1. General description of project activity

>>

The project activity is a 100 MW (50 X 2 phases) solar power project promoted by Orange Suvaan Energy Private Limited. The purpose of the project activity is to generate electrical power through operation of Solar photovoltaic power plant. The total installed capacity of the project activity is 100 MW comprising of poly-crystalline solar PV modules of 265/270 Wp each from a Tier I supplier.

The electricity generated by the project is exported to the Indian electricity grid. The project activity displaces an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid and thereby has resulted in reduction of the associated CO₂ emissions. The monitoring of emission reduction and sustainable development indicators have been carried out in accordance to respective registered PDD and Passport.

Currently the project activity has been commissioned and is operational. The below table reflects the commissioning details.

| Capacity | Commissioning Date | Status |
|--------------------|--------------------|-------------|
| 100 MW (2 x 50 MW) | 16/06/2017 | Operational |

The present monitoring period is from 16/06/2017 to 30/06/2018 through which emission reduction claimed is 198,191 tCO₂e.

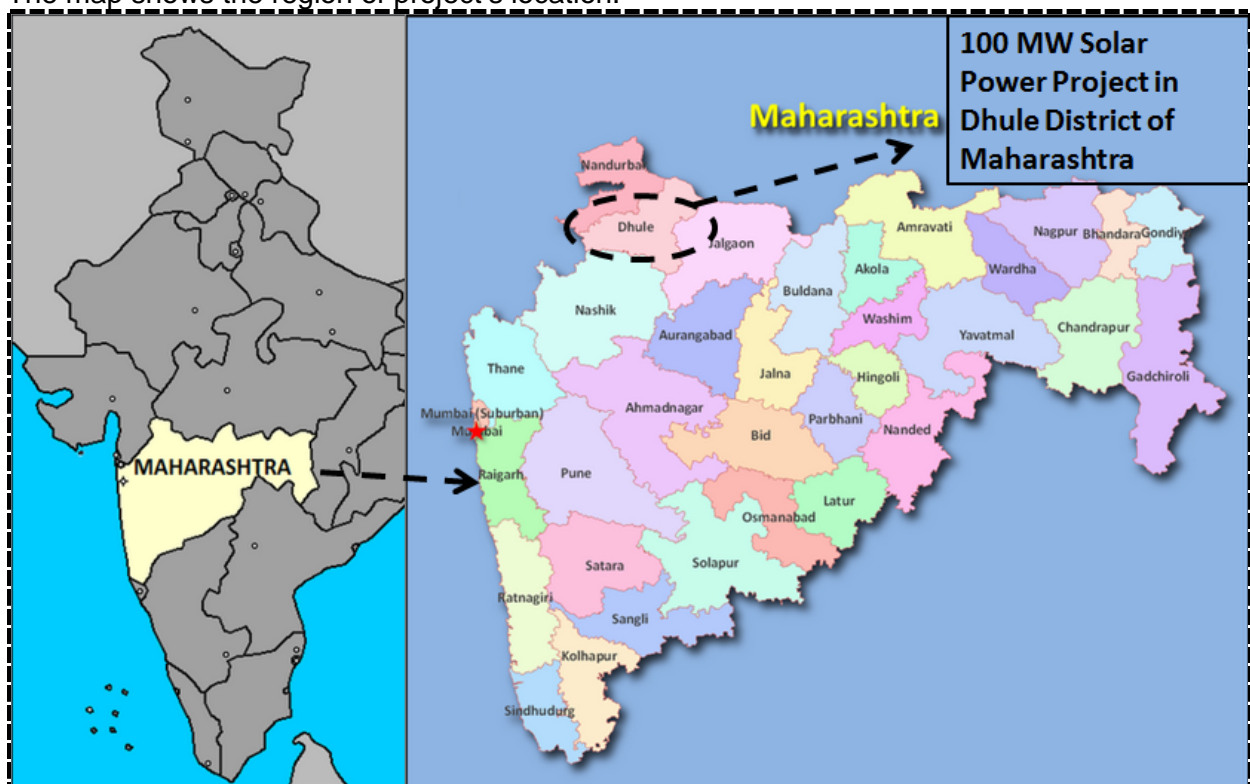
A.2. Location of project activity

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The project activity is located in the village Mhasale of Dhule District in the state of Maharashtra, India. Details of co-ordinates of project are given below:

GPS co-ordinates of the project activity is as below: 21° 06' 28.8"N & 74° 26' 27.6"E

The map shows the region of project's location:



A.3. Parties and project participants

| Parties involved | Project participants | Indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|------------------|---|--|
| India (Host) | Orange Suvaan Energy Private Limited (Private Entity) | No |

A.4. Reference to applied methodologies and standardized baselines

>>

Title: Grid-connected electricity generation from renewable sources

References: Approved Large Scale Consolidated Methodology: ACM0002 “Grid-connected electricity generation from renewable sources” (Version 17.0, EB 89)¹

ACM0002 draws upon the following tools which have been used in the PDD:

Methodological Tool: Tool for the demonstration and assessment of additionality - Version 07.0.0, EB 70 Annex 8².

Methodological Tool: Tool to calculate the emission factor for an electricity system - Version 06.0, EB 97 Annex 7³

A.5. Crediting period type and duration

>>

Type of Crediting Period: Renewable

Start date of the crediting period: 16/06/2017 (Retroactive crediting start date)

Length of the current crediting period: 7 years

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

>>

Total installed capacity of 100 MW_{ac}. The solar PV power plant has solar PV modules, inverters, transformers and other protection system and supporting components as under:

| Solar PV modules (Make) | JA Solar | JA Solar |
|-------------------------|---------------------------|---------------------------|
| Technology | 60-cell multi Crystalline | 60-cell multi Crystalline |
| Model | JAP 6(K) 60 265 4BB | JAP 6(K) 60 270 4BB |
| Capacity | 265 Wp | 270 Wp |
| No. of Modules | 208320 | 306720 |

¹ <https://cdm.unfccc.int/UserManagement/FileStorage/D5YFS9I3VKBT18MQNGX0LPZ6U7AWCO>

² <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf>

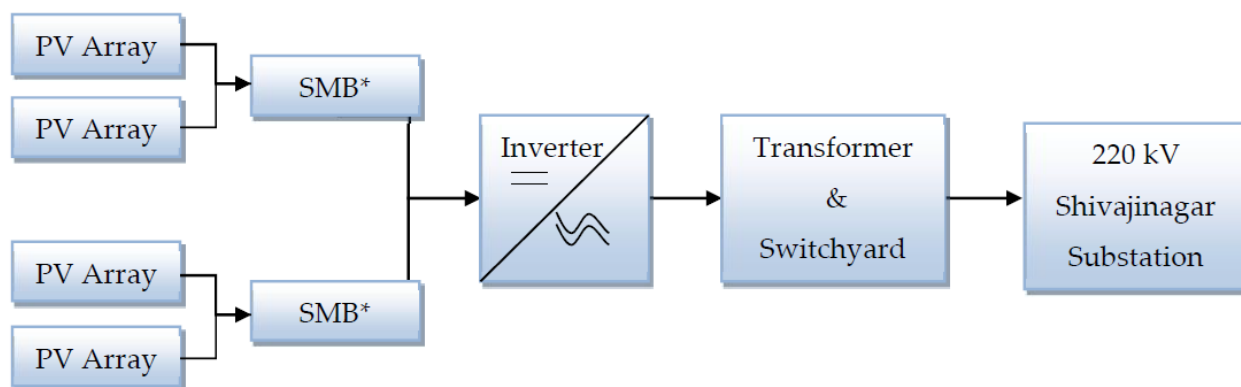
| | | |
|-------------------------|------------|----------|
| Capacity, MW (DC) | 55.20MWp | 82.81MWp |
| Total Capacity, MW (DC) | 138.00 MWp | |
| Total Capacity, MW (AC) | 100 MW | |

| | |
|-------------------------|------------|
| Inverters (Make) | ABB |
| Model | PVS800-57 |
| Rated Capacity | 1000 KW |
| No. of Inverters | 100 |
| Rated Input Voltage | 1000 V DC |

| | | | |
|----------------------------|------------------|---------------------|---------------------|
| Transformers (Make) | Prolec GE | Sudhir Power | Sudhir Power |
| Model No. | ONAF | ONAN | ONAN |
| Capacity | 50/60 MVA | 4 MVA | 2 MVA |
| No. of Transformers | 02 | 24 | 02 |
| Voltage Ratio | 11/132 KV | 4 x 380 V/ 11 kV | 2x 380 V/ 11 kV |

The generated power from the project is evacuated through 132 kV transmission line at 220/132 kV Shivajinagar substation located in district Dhule, Maharashtra. The cost of laying the transmission line from Project site up to the substation would be borne by the project company.

A simplified scheme of Solar PV system is shown in Figure below.



*SMB: String Monitoring Box

The average lifetime of the project is around 25 years as per the equipment supplier specifications. The plant load factor assessed at project site is 19.25%.

In the absence of the project activity the equivalent amount of electricity sold to grid would have been generated by grid connected power plants, which is predominantly based on fossil fuels, hence baseline scenario of the project activity is the grid based electricity system, which is also the pre-project scenario.

The technology and the project do not pose any adverse threat to the environment and contribute positively in reducing GHG emissions by displacing energy generation from fossil fuel powered projects. The proposed project activity is environmentally safe to implement and operate.

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies or standardized baselines

NA

B.2.2. Corrections

NA

B.2.3. Changes to the start date of the crediting period

NA

B.2.4. Inclusion of monitoring plan

NA

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

NA

B.2.6. Changes to project design

NA

SECTION C. Description of monitoring system

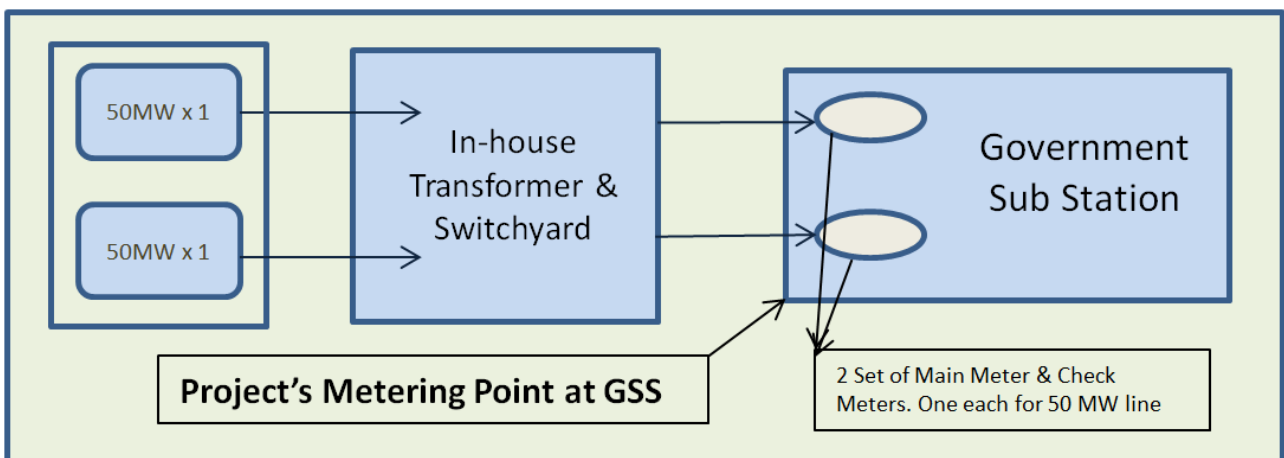
>>

Net electricity supplied will be estimated based on the difference between values of “export” and “import” which are monitored through DISCOM energy meter installed at the Government sub-station (evacuation point).

Net Electricity = Export – Import

The monthly export and import of electricity reading are recorded every month by the DISCOM in presence of the PP’s representative and it will be recorded in the JMR/monthly generation statement. The net electricity generation will be sourced from the monthly generation statement/JMR. There are two bays and electricity is evacuated to the GSS through two lines and each has a dedicated set of main and check meter.

The project’s metering arrangement representation:

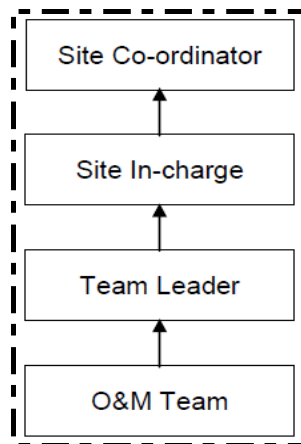


Note; There are two bays and electricity is evacuated to the GSS through two lines and each has a dedicated set of main and check meter.

The project proponent has entered into agreement equipment supplier or a third for the operation and maintenance of solar power plant. The equipment suppliers have dedicated and technically

well-equipped O&M team for day-to-day Operation and maintenance of each component. Orange's team has taken up in house O&M and it will provide a monthly report, which includes generation data, major breakdown events and equipment availability. Project manager is responsible for recording of monthly meter readings of export and import. Monthly power export and import data will be sent regularly to site in charge.

The data for the project is compiled by the O&M Team and subsequently stored by the Site Co-ordinator at head office, the reporting and data flows as per the below mentioned flow chart starting from Site O&M team which monitors day to day operational data and monthly recording. The roles and responsibilities for the project are described as below;



Personal Training:

The training for operating and maintaining the plant will be provided to the O&M team whenever there would be necessity or any technological up gradation

Monitoring Process at project site

Joint monthly meter reading shall be taken from substation meter by representative of DISCOM and O&M team. It must be noted here that the meter readings as mentioned above shall be calculated as the product of meter multiplication factor and the difference of the current and previous meter readings

Emergency preparedness:

In case Main meter or Check meter is found to be outside the acceptable limits of accuracy or faulty or not functioning properly, it will be repaired, recalibrated or replaced as soon as possible. In the event that the Main meter is not in service as a result of maintenance, repairs or testing, the Check meter will be used for readings

The monthly monitored value of the import, export and net generation are given below:

| Month | Export (MWh) | Import (MWh) | Net export (MWh) |
|---------|--------------|--------------|------------------|
| Jun-17* | - | - | - |
| Jul-17* | 5,771 | 32 | 5,738 |
| Aug-17 | 13,295 | 65 | 13,231 |
| Sep-17 | 16,401 | 68 | 16,333 |
| Oct-17 | 17,934 | 72 | 17,862 |
| Nov-17 | 16,820 | 70 | 16,750 |
| Dec-17 | 16,178 | 73 | 16,104 |
| Jan-18 | 19,198 | 72 | 19,126 |

| | | | |
|--------------|----------------|------------|----------------|
| Feb-18 | 18,166 | 65 | 18,101 |
| Mar-18 | 20,425 | 71 | 20,354 |
| Apr-18 | 20,668 | 68 | 20,600 |
| May-18 | 21,820 | 70 | 21,750 |
| Jun-18 | 16,829 | 65 | 16,763 |
| Total | 223,162 | 884 | 222,277 |

* Since JMR is available only from commercial operation date ie, 16th July 2017, the energy readings are taken from this date.

Year wise break up:

| Year | Export (MWh) | Import (MWh) | Net export (MWh) |
|--------------|----------------|--------------|------------------|
| 2017 | 86,398 | 380 | 86,018 |
| 2018 | 117,106 | 412 | 116,694 |
| Total | 203,504 | 792 | 202,712 |

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

(Copy this table for each data or parameter.)

| | |
|--|---|
| Data / Parameter | EF_{OM, y} |
| Unit | tCO ₂ /MWh |
| Description | Operating Margin CO ₂ emission factor for the Indian Grid in year y |
| Source of data | CEA's "Baseline Carbon Dioxide Emission Database Version 11.0" |
| Value(s) applied | 0.9941 |
| Choice of data or Measurement methods and procedures | Calculated in line with "Tool to calculate the emission factor for an electricity system (Version 06)" using data from Central Electricity Authority of India's (CEA) "Baseline Carbon Dioxide Emission Database Version 11.0". The value used is calculated ex-ante as generation based weighted average of last three years of the operating margin provided in the CEA database. Weighted average = $\frac{\sum_{i=1 \text{ to } n} (\text{Net generation in operating margin in year } i * \text{Simple operating margin in year } i)}{\sum_{i=1 \text{ to } n} (\text{Net generation in operating margin of year } i)}$ |
| Purpose of data | Calculation of baseline emissions |
| Additional comment | The value is fixed ex-ante |

| | |
|------------------|--|
| Data / Parameter | EF_{BM, y} |
| Unit | tCO ₂ /MWh |
| Description | Build Margin CO ₂ emission factor for the Indian Grid in year y |
| Source of data | CEA's "Baseline Carbon Dioxide Emission Database Version 11.0" |
| Value(s) applied | 0.9285 |

| | |
|--|---|
| Choice of data or Measurement methods and procedures | Calculated in line with “ <i>Tool to calculate the emission factor for an electricity system (Version 06)</i> ” using data from Central Electricity Authority of India’s (CEA) “ <i>Baseline Carbon Dioxide Emission Database Version 11.0</i> ”. The value is calculated ex-ante as most recent build margin provided by the CEA. |
| Purpose of data | <i>Calculation of baseline emissions</i> |
| Additional comment | The value is fixed ex-ante |

| | |
|--|--|
| Data / Parameter | EF_{grid,CM, y} |
| Unit | tCO ₂ /MWh |
| Description | Combined Margin CO ₂ emission factor for the Indian Grid in year y |
| Source of data | Central Electricity Authority(CEA) of India Database <i>Version 11.0</i> |
| Value(s) applied | 0.9777 |
| Choice of data or Measurement methods and procedures | This has been calculated based on Operating Margin (OM) and Build Margin (BM) published by Central Electricity Authority (CEA) of India. Please refer section B.6.1 for details. |
| Purpose of data | <i>Calculation of baseline emissions</i> |
| Additional comment | The value is fixed ex-ante |

D.2. Data and parameters monitored

(Copy this table for each data or parameter.)

| | |
|---------------------------------|---|
| Data/Parameter | EG facility,y⁴ |
| Unit | MWh |
| Description | Quantity of net electricity supplied to the grid during the year y. |
| Measured/calculated/default | Measured |
| Source of data | Monthly energy generation statement issued by State Electricity Board. These are called JMR (Joint Meter Reading) |
| Value(s) of monitored parameter | 202,712 |

⁴ Since the project activity is the installation of a Greenfield power plant, $EGPJ,y = EGfacility,y$

| Monitoring equipment | Energy Meter installed at the government sub-station (GSS). The details of the energy meters are given below: | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|---------------|--------------|---------|---------|---------|------|--------|--------|--------|----------------|------|------|------|-------------------|--------------------------|--------------------------|--------------------------|-----------------------|------------|------------|------------|
| | Line 1: | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Details</th> <th>Main Meter</th> <th>Check meter</th> <th>Standby meter</th> </tr> </thead> <tbody> <tr> <td>Meter Number</td> <td>2831505</td> <td>2831506</td> <td>2831507</td> </tr> <tr> <td>Make</td> <td>Elster</td> <td>Elster</td> <td>Elster</td> </tr> <tr> <td>Accuracy Class</td> <td>0.2S</td> <td>0.2S</td> <td>0.2S</td> </tr> <tr> <td>Calibration dates</td> <td>08/01/2018 25/01/2019</td> <td>08/01/2018 25/01/2019</td> <td>08/01/2018 25/01/2019</td> </tr> <tr> <td>Calibration due date*</td> <td>25/01/2024</td> <td>25/01/2024</td> <td>25/01/2024</td> </tr> </tbody> </table> | Details | Main Meter | Check meter | Standby meter | Meter Number | 2831505 | 2831506 | 2831507 | Make | Elster | Elster | Elster | Accuracy Class | 0.2S | 0.2S | 0.2S | Calibration dates | 08/01/2018 25/01/2019 | 08/01/2018 25/01/2019 | 08/01/2018 25/01/2019 | Calibration due date* | 25/01/2024 | 25/01/2024 | 25/01/2024 |
| | Details | Main Meter | Check meter | Standby meter | | | | | | | | | | | | | | | | | | | | | |
| | Meter Number | 2831505 | 2831506 | 2831507 | | | | | | | | | | | | | | | | | | | | | |
| | Make | Elster | Elster | Elster | | | | | | | | | | | | | | | | | | | | | |
| | Accuracy Class | 0.2S | 0.2S | 0.2S | | | | | | | | | | | | | | | | | | | | | |
| | Calibration dates | 08/01/2018 25/01/2019 | 08/01/2018 25/01/2019 | 08/01/2018 25/01/2019 | | | | | | | | | | | | | | | | | | | | | |
| | Calibration due date* | 25/01/2024 | 25/01/2024 | 25/01/2024 | | | | | | | | | | | | | | | | | | | | | |
| | Line 2: | | | | | | | | | | | | | | | | | | | | | | | | |
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| | Details | Main Meter | Check meter | Standby meter | | | | | | | | | | | | | | | | | | | | | |
| | Meter Number | 2831508 | 2831509 | 2831510 | | | | | | | | | | | | | | | | | | | | | |
| | Make | Elster | Elster | Elster | | | | | | | | | | | | | | | | | | | | | |
| Accuracy Class | 0.2S | 0.2S | 0.2S | | | | | | | | | | | | | | | | | | | | | | |
| Calibration dates | 08/01/2018 25/01/2019 | 08/01/2018 25/01/2019 | 08/01/2018 25/01/2019 | | | | | | | | | | | | | | | | | | | | | | |
| Calibration due date* | 25/01/2024 | 25/01/2024 | 25/01/2024 | | | | | | | | | | | | | | | | | | | | | | |
| * As mentioned in the PDD, the calibration frequency requirement is once in 5 years | | | | | | | | | | | | | | | | | | | | | | | | | |
| Measuring/reading/recording frequency | Measurement: Continuous Recording: Monthly Monitoring Method: recording in JMR (Join Meter Reading) The JMR includes, monthly recording of electricity export & import. Energy meters of accuracy class 0.2s are used at site. | | | | | | | | | | | | | | | | | | | | | | | | |
| Calculation method (if applicable) | Net electricity supplied will be calculated based on the difference between values of "export" and "import" on the EB energy meter at the Government substation (evacuation point). (Net Electricity = Export – Import) The export and import of electricity reading will be sourced from the monthly generation statement/JMR. There are two bays and electricity is evacuated to the GSS through two lines and each has a dedicated set of main and check meter. | | | | | | | | | | | | | | | | | | | | | | | | |
| QA/QC procedures | Net electricity supplied to the grid by the project activity has been cross checked with invoices submitted for the sale of power by the project proponent. Calibration of all the meters will be undertaken at least once in 5 years calibration or whenever abnormal difference/inconsistency is observed between main meter and check meter and faulty meters will be duly replaced immediately. | | | | | | | | | | | | | | | | | | | | | | | | |
| Purpose of data/parameter | Calculation of baseline emission | | | | | | | | | | | | | | | | | | | | | | | | |
| Additional comments | Calibration Agency for all the meters is DISCOM. As per the registered PDD, the calibration dates and frequency is under the control of state utility. | | | | | | | | | | | | | | | | | | | | | | | | |

SD Parameters monitored

| | |
|---------------------------------|---|
| No | 1 |
| Indicator | Air quality |
| Mitigation measure | None |
| Chosen parameter | Electricity generation and equivalent of PM, NOx and SOx avoided. |
| Baseline situation of parameter | In the baseline, equivalent electricity supplied by Indian grid which is generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid. |
| Value for the current | Electricity generation:202,712 MWh |

| | | |
|-----------------------------|--------|---|
| monitoring period | | As per the Ministry of Environment and Forest and Climate change ⁵ , the latest revised emission standard for the new thermal power plants are: PM10 - 0.98 kg/MWh SO ₂ - 7.3 Kg/MWh NOx - 4.8 kg/MWh Hence, with the displacement of 202,712 MWh from fossil fuel based grid, the project avoids approximately 199 tonnes of PM10, 1,480 tonnes of SO ₂ and 973 tonnes of NOx. Since actual PM10, SO ₂ & NOx emission data from grid-connected power plants are not available publically, the MOEF&CC standard is considered for estimation of these emissions that are avoided due to the project activity. Hence, the above is an approximate estimation just to show the positive impact on the Air Quality due to the project activity. |
| Future target for parameter | | PM, NOx and SOx avoidance equivalent to the electricity generation of 168,630 MWh/year |
| Way of monitoring | How | Electricity generation is measured through energy meter. |
| | When | Continuous monitoring and monthly recording |
| | By who | DISCOM & Project/Plant Manager |

| | | |
|---|---|-------------------------------|
| No | 2 | |
| Indicator | Quality of employment | |
| Mitigation measure | None | |
| Chosen parameter | Training or workshops | |
| Baseline situation of parameter | No trainings or workshops are conducted and local people have no such opportunities to be trained on the technology and the monitoring of the plant operation, and the emergency and safety procedures. | |
| Value for the current monitoring period | <p>Trainings & workshops where conducted to the O&M staffs by management.</p> <ol style="list-style-type: none"> 1) HSE Training Record 2) Regular Drill Record 3) Handling of Equipment Training 4) Soft Skill Training <p>The list of training programmes conducted during the monitoring period are:</p> <ul style="list-style-type: none"> • O&M Inverter Training 14th October 2017 • SCADA system trouble shooting training on 2nd November 2017 • EHS Training on 28th January & 2nd February 2018 <p>The training records are submitted to VVB. 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.</p> | |
| Future target for parameter | Continuation of regular trainings/workshops for employees & O&M staffs | |
| Way of monitoring | How | Training Records of employees |
| | When | Annually |
| | By who | Project proponent |

| | | |
|-----------------------|--|--|
| No | 3 | |
| Indicator | Livelihood of the poor | |
| Mitigation measure | None | |
| Chosen parameter | CSR activities done in project area (like Health Camps, educational toolkit supply to local schools, Knowledge and information dissemination regarding natural disasters etc) | |
| Baseline situation of | No activity except Government facilities | |

⁵ <http://pib.nic.in/newsite/archiveReleases.aspx> (MOEFCC press release, 22-December-2015)

| | | |
|---|---|--|
| parameter | | |
| Value for the current monitoring period | <p>PP conducted survey during construction phase of the project in the villages near project locations to check the requirement of facilities by the villages. From the survey, PP has identified several scope of developmental activities such as health camps, furniture, sports kits and toilet requirements in government schools, drinking water requirements etc.</p> <p>PP has started implementing the CSR activities. During the monitoring period the CSR activities like:</p> <ol style="list-style-type: none"> 1) Water purification plant installed at 20 locations including villages panchayat, schools & temples 2) Distribution of notebooks in Primary School, Village- Mhasale Taluka- Sakri Dist- Dhule, Maharashtra <p>The activities carried out are focused to up held the livelihood of the poor as, it is the poor in the project region who are mostly deprived of the basic facilities such as sanitation, education and medical attention. The table preceding has more details.</p> <p>The project will have positive impact on this parameter as there were no socially oriented CSR activities before the project activity. Thus the project has positive impact on the indicator.</p> | |
| Future target for parameter | Health Camps, Knowledge and information dissemination regarding natural disasters are done by PP based on the requirement in the project location. | |
| Way of monitoring | How | CSR records and photographic evidence. |
| | When | As and when it is done |
| | By who | Project Coordinator |

| | | |
|---|---|---|
| No | 4 | |
| Indicator | Access to affordable and clean energy services | |
| Mitigation measure | None | |
| Chosen parameter | Electricity exported to grid | |
| Baseline situation of parameter | No electricity is generated at the site. Hence, the equivalent energy was generated from the fossil fuel based grid connected power plants. | |
| Value for the current monitoring period | 202,712 MWh of clean electricity supplied to grid by the project activity | |
| Future target for parameter | 168,630 MWh/year of electricity supplied to grid by the project activity | |
| Way of monitoring | How | Through energy meters which will be jointly recorded monthly by state DISCOM & PP in the joint meter reading statement. |
| | When | Continuously monitored & recorded monthly |
| | By who | DISCOM and Project proponent |

| | | |
|---|--|--|
| No | 5 | |
| Indicator | Human and Institutional capacity | |
| Mitigation measure | None | |
| Chosen parameter | Welfare activities, Training or workshops conducted to PP Awareness programs conducted to local public | |
| Baseline situation of parameter | In baseline situation, welfare activities, trainings or workshops, programs are not conducted. | |
| Value for the current monitoring period | PP conducted Water conservation awareness workshop at the Mhasale Village on 3 rd February 2018. Local village people attended the workshop. In the workshop, people were taught about the need of energy conservation and different ways of energy conservation techniques. PP also installed water purification plants at 20 different places that will encourage people to use clean drinking water. PP also planned conduct additional welfare activities and workshops in the futures. | |
| Future target for parameter | More number of seminars to be conducted annually | |
| Way of monitoring | How | Welfare activity, Training/program records |
| | When | Yearly |

| | | |
|--|--------|-------------------|
| | By who | Project proponent |
|--|--------|-------------------|

| No | 6 | | | | | | | | | | | | | | | | | | | | |
|---|--|--------------------------|---------------------|-----------------|--|--|--|------------------------|------------------------|---------------------|-------|------|----|----|----|----|------|----|----|----|----|
| Indicator | Quantitative employment and income generation | | | | | | | | | | | | | | | | | | | | |
| Mitigation measure | None | | | | | | | | | | | | | | | | | | | | |
| Chosen parameter | Number of jobs created due to project/ income opportunities | | | | | | | | | | | | | | | | | | | | |
| Baseline situation of parameter | No jobs created in baseline as no activity due to the project would take place in the remote village area. | | | | | | | | | | | | | | | | | | | | |
| Value for the current monitoring period | <p>The project created over 80 jobs for over a span of 9 months during construction and during the operational phase is generating employment in rural areas to the extent of 100 people at any given point of time.</p> <p>About 278 lakh INR has been spent in the operation and maintenance of the power plant during the monitoring period.</p> <p>The O&M service provider maintains a healthy number of employees at the site, and also hires locally for unskilled workers; which helps in creating service based jobs in the project region. Below table reflects cost of O&M and number of staff:</p> <table border="1"> <thead> <tr> <th rowspan="2">Year</th> <th colspan="4">Number of Staff</th> </tr> <tr> <th>Security (third party)</th> <th>Cleaning (third party)</th> <th>O&M (Orange Suvaan)</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2017</td> <td>32</td> <td>15</td> <td>50</td> <td>97</td> </tr> <tr> <td>2018</td> <td>32</td> <td>15</td> <td>48</td> <td>95</td> </tr> </tbody> </table> <p>The EPF challan has been submitted which shows number of staffs appointed by the PP. Also the security service contract and cleaning service contracts are submitted to VVB for verification.</p> <p>The parameter has a positive impact as the project results in direct employment and income generation.</p> | | Year | Number of Staff | | | | Security (third party) | Cleaning (third party) | O&M (Orange Suvaan) | Total | 2017 | 32 | 15 | 50 | 97 | 2018 | 32 | 15 | 48 | 95 |
| Year | Number of Staff | | | | | | | | | | | | | | | | | | | | |
| | Security (third party) | Cleaning (third party) | O&M (Orange Suvaan) | Total | | | | | | | | | | | | | | | | | |
| 2017 | 32 | 15 | 50 | 97 | | | | | | | | | | | | | | | | | |
| 2018 | 32 | 15 | 48 | 95 | | | | | | | | | | | | | | | | | |
| Future target for parameter | Continued employment of O&M staff and security. Explore opportunity to engage more villagers. The project security staffs are local villagers and hence the project has also generated employment and income for local villagers. | | | | | | | | | | | | | | | | | | | | |
| Way of monitoring | How | Plant employment records | | | | | | | | | | | | | | | | | | | |
| | When | Yearly once | | | | | | | | | | | | | | | | | | | |
| | By who | O & M Contractor | | | | | | | | | | | | | | | | | | | |

D.3. Implementation of sampling plan

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Not applicable

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

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The baseline emission is calculated in line with para 44 of AC0002, Version 17, using equation below

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

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 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)

AS per para 46 of ACM0002, version 17, when the project activity is installation of Greenfield power plant, then:

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

Where,

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

Hence, the baseline emission is estimated as below:

| Year | $EG_{PJ,y} / EG_{facility, y}$ (MWh) | $EF_{grid,CM,y}$ (tCO ₂ /MWh) | BE_y^* (tCO ₂) |
|--------------|---|---|---------------------------------|
| 2017 | 86,018 | 0.9777 | 84,100 |
| 2018 | 116,694 | 0.9777 | 114,091 |
| Total | 202,712 | 0.9777 | 198,191 |

*Rounded down value

E.2. Calculation of project emissions or actual net removals

>>

As per the approved consolidated Methodology ACM0002 (Version 17.0, EB 89, Annex 1) para 36:

“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 as project emissions by using the following equation:

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

Where:

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

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (t CO₂/yr)

$PE_{GP,y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO₂e/yr)

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (t CO₂e/yr)”

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

E.3. Calculation of leakage emissions

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As per PDD, no source of leakage emissions identified under proposed project activity.

Hence, $LE_y = 0$

E.4. Calculation of emission reductions or net anthropogenic removals

| Year | Baseline GHG emissions or baseline net GHG removals (t CO ₂ e) | Project GHG emissions or actual net GHG removals (t CO ₂ e) | Leakage GHG emissions (t CO ₂ e) | GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e) | | |
|--------------|---|--|---|---|-----------------|----------------|
| | | | | Before 01/01/2013 | From 01/01/2013 | Total amount |
| 2017 | 84,100 | 0 | 0 | NA | 84,100 | 84,100 |
| 2018 | 114,091 | 0 | 0 | NA | 114,091 | 114,091 |
| Total | 198,191 | 0 | 0 | NA | 198,191 | 198,191 |

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

| Amount achieved during this monitoring period (t CO ₂ e) | Amount estimated ex ante (t CO ₂ e) |
|---|--|
| 198,191 | 171,644 |

E.6. Remarks on increase in achieved emission reductions

>>

The actual achieved emission reduction is 15.5% higher than the estimated emission reduction. This is due that, the actual achieved PLF during the monitoring period is 15.5% higher than the estimated PLF considered during validation. It is observed that the actual radiation received at the site during the monitoring period is higher compared the expected radiation determined during investment decision time which results in higher generation.

As per the registered PDD, the equity IRR will reach the benchmark when the PLF increased to 28.16% higher than estimated value. Hence, the increase in generation/PLF does not affect the additionality of the project as the actual generation is only 15.5% higher than the estimated value.

E.7. Grievance Records

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As per the registered PDD, the grievance mechanism is in place in the project activity. Any grievance received via email, post, telephone or verbal are recorded in the grievance form and the details of how, when by whom the grievance is addressed is also recorded in the form. Till now no grievance received for this project. The copy of the grievance register/form is submitted to VVB.