



RENEWABLE SOLAR POWER PROJECT BY RISHABH RENERGY



Document Prepared By EKI Energy Services Limited

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CONTENTS

1	PROJECT DETAILS.....	4
1.1	Summary Description of the Implementation Status of the Project	4
1.2	Sectoral Scope and Project Type	4
1.3	Project Proponent	5
1.4	Other Entities Involved in the Project	5
1.5	Project Start Date	5
1.6	Project Crediting Period	5
1.7	Project Location	6
1.8	Title and Reference of Methodology	7
1.9	Participation under other GHG Programs.....	7
1.10	Other Forms of Credit.....	7
1.11	Sustainable Development.....	8
2	SAFEGUARDS.....	8
2.3	AFOLU-Specific Safeguards	10
3	IMPLEMENTATION STATUS	11
3.1	Implementation Status of the Project Activity	11
3.2	Deviations	11
3.3	Grouped Projects	12
4	DATA AND PARAMETERS.....	12
4.1	Data and Parameters Available at Validation	12
4.2	Data and Parameters Monitored.....	13
4.3	Monitoring Plan	15
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	17
5.1	Baseline Emissions	17
5.2	Project Emissions	18
5.3	Leakage.....	18
5.4	Net GHG Emission Reductions and Removals.....	18

APPENDIX 1: CALIBRATION DETAILS	20
APPENDIX 2: BREAKDOWN DETAILS	21

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source. The project involves installation of 14 MW solar project in Harapanahalli village in Davangere district of Karnataka.

Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 23,089 tCO₂e per year, thereon displacing 24,647 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant. The details of the project is mentioned in the table below.

Project Investor	Capacity (MW)	COD	Connection with the Grid	State	Usage
Rishabh Buildwell Pvt. Ltd	14	28-March-2018	Indian Grid	Karnataka	Sale to Grid

Baseline Scenario:

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

As the project activity falls under the definition of a Greenfield power plant, the baseline scenario as per paragraph 19 of Section 5.1 of applied methodology is the following:

If the project activity is the installation of a Greenfield power plant, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

Total emission reductions achieved in this monitoring period:

During the Current Monitoring Period from 02-November-2019 to 30-June-2021 (First and last date included) the project activity has supplied 25,869 MWh of electricity, and thus contributing to the GHG reductions 24,224 tCO₂e.

1.2 Sectoral Scope and Project Type

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

Sectoral Scope : 01 - Energy industries (renewable / non-renewable sources)
Project Type : I - Renewable Energy Projects

Project Category : Grid-connected electricity generation from renewable sources AMS-I.D(Version 18.0)

The project is not a grouped project activity

1.3 Project Proponent

Organization name	Rishabh Renergy Pvt. Ltd.
Contact person	Mr. Vipin Gupta
Title	Executive Director
Address	196, LGF, Ram Vihar, East Delhi, New Delhi-110092, India
Telephone	
Email	registry@enkingint.org

1.4 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the Project	Project Consultant
Contact person	Ms. Neetu Yadav
Title	Project Consultant
Address	EnKing Embassy, Office No 201, Plot 48, Scheme 78, Part 2, VijayNagar, Indore- 452010, Madhya Pradesh, India.
Telephone	+91-731-4289086
Email	registry@enkingint.org

1.5 Project Start Date

Start date of the project activity is the earliest date of interconnection with the grid i.e. 28-March-2018. This is the date of commissioning of 14 MW solar PV project activity

1.6 Project Crediting Period

Crediting Period Start date: 28-March-2018

Crediting Period End date: 27-March-2028

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

1.7 Project Location

The details of the project locations and the Geo-coordinates are mentioned in the table below

Project Investor	Capacity (MW)	Village	District	State	Latitude	Longitude
Rishabh Buildwell Pvt. Ltd.	14	Harapanhalli	Davanagere	Karnataka	14° 47' 31.329 6" N	76° 05' 12.1200" E

The project location has been highlighted in the map below-



1.8 Title and Reference of Methodology

Title	: Grid-connected electricity generation from renewable sources
Methodology	: Grid-connected electricity generation from renewable sources AMS-I.D (Version18.0) ¹
Type I	: Energy industries (renewable / non-renewable sources)
Category	: Approved Consolidated Methodology (AMS-I.D.: Grid connected renewable electricity generation --- Version 18.0)

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

- Tool to calculate the emission factor for an electricity system² - Version 07.0 (EB 100,Annex 04)

1.9 Participation under other GHG Programs

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

Project proponent has also provided undertaking that in order to avoid double accounting it will not claim GHG credits in any GHG program other than that in VERRA in the current monitoring period.

1.10 Other Forms of Credit

- Emission Trading Programs and Other Binding Limits: The project proponent is not participating in any other emission trading program and other binding limits.
- Other Forms of Environmental Credit: The project activity neither has nor intends to generate any other form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS Program.
- Participation under Other GHG Programs: Project has not been registered and it is not seeking registration under any other GHG programs. Project is not rejected under any other GHG program.
- Also it can be crosschecked that PP is not claiming REC benefits, the same can be verified with the REC accreditation body of India³.

¹ <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

² <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

³ https://www.recregistryindia.nic.in/index.php/publics/accredited_regens

1.11 Sustainable Development

Contribution to sustainable development:

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

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

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

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

Environmental well-being: Solar being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

2 SAFEGUARDS

2.1 No Net Harm

The project activity does not cause any harm to the local ecology. It primarily requires the installation of the Solar PV project, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories. As per the Schedule 1 of Ministry of Environment, Forests and Climate Change (Government of India) notification dated 14-September-2006, solar power projects do not require an Environmental Impact Assessment.

The report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013 clearly mentioned that solar project activity operations do not result in direct air pollution, noise pollution. Please refer below web link for the same.

<https://smartnet.niua.org/sites/default/files/resources/report-on-developmental-impacts-ofRE.pdf>

However, there are no negative impacts on air, water; soil quality and ambience are envisaged due to the project activity. As it is a solar power project, there is no environmental pollution due

to the operation of this plant. Also this plant helped in employment for the local people thus improved the socioeconomic status of the region

2.2 Local Stakeholder Consultation

The project proponents organized stakeholders meeting in order to take into account the concerns of the nearby villagers regarding the project implementation. As a part of continuous feedback from stakeholders, there were no other major comments or protest raised by the stakeholders and they were totally in support for setting up of these kinds of projects in the region. The 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.

The process of local stakeholder consultation is on-going and continuous. Grievance Register is used to record the grievances and feedback. During the current monitoring period, no negative feedback or grievance was received from local stakeholder, therefore, no mitigation measures was required. In case of grievances, the nature of probable resolution is discussed with the plant head office and implemented by the site in-charge.

During the current monitoring period, following complaints were registered in the grievance register which were resolved by the Project proponent.

Sl. No	Date of Complaint	Site	Topic	Date of Resolution	Remark from PP
1	04-December-2019	Harapanahalli village Devanagere district, Karnataka.	Request to repair roof of school.	08-December-2019	Roof properly repaired.
2	12-January-2020		Street lights not working.	22-January-2020	Street lights have been changed
3	27-January-2020		Request to repair RO at the primary school.	02-February-2020	RO purifier was repaired
4	10-February-2020		Roads to site having pit holes	15-February-2020	Road Repaired

5	15-February-2020		Request to repair seepage in school roof	19-February-2020	Roof properly repaired.
6	22-April-2020		Street lights not working.	26-April-2020	Street lights have been changed.
7	07-June-2020		Request to repair RO at the primary school.	10-June -2020	RO purifier was repaired.
8	12-August-2020		Roads to site having pit holes	16-August-2020	Road Repaired
9	18-October-2020		Street lights not working.	24-October-2020	Street lights have been changed
10	12-January-2021		Roads to site having pit holes	20-January-2021	Road Repaired
11	18-March-2021		Street lights not working.	25- March-2021	Street lights have been changed

2.3 AFOLU-Specific Safeguards

Not applicable to this as this is not an AFOLU project activity.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity involves the installation of Solar PV project. The total installed capacity of the project is 14 MW of Solar PV plant located at Harapanahalli village in Devanagere district of Karnataka.

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

In the Pre- project scenario the entire electricity, delivered to the grid by the project activity, would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

The project result in replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 23,089 tCO₂e per year, thereon displacing 24,647MWh/year amount of electricity from the grid over the 10 years crediting period.

The project activity aims to harness solar energy through installation of Solar PV project with total installed capacity of 14 MW.

The technical details of the 14 MW solar project by Rishabh Renergy Pvt. Ltd

Sl. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Multi-Crystalline silicon)
2	Number of modules and their capacity	Module Make-Canadian SolarNo. of Modules- 47620 Model capacity- 315Wp
3	Number of Inverters& Capacity	Inverter Make-ABB No. of Inverters used- 14 Capacity-1000 KW

3.2 Deviations

2.3.1 Methodology Deviations

There is no methodology deviation.

2.3.2 Project Description Deviations

There is no Project description deviations applied during current monitoring period.

3.3 Grouped Projects

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

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid, OM, y}
Data unit	tCO ₂ /MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14, Dec 2018 ⁴
Value applied	0.9610
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 7.0” as 3-year generation weighted average using data for the years 2015-16, 2016-17 & 2017-18. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 14, published by the Central Electricity Authority, Ministry of Power, Government of India
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	EF _{grid, BM, y}
Data unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14, Dec 2018 ⁵
Value applied	0.8644
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 7.0” as per the latest data available for the most recent year 2017-18. The data is obtained from “CO ₂ Baseline Database for Indian Power Sector” version 14,

⁴ https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver14.pdf

⁵ https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver14.pdf

	published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period

Data / Parameter	$EF_{grid,CM}$
Data unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14, Dec 2018 ⁶
Value applied	0.9368
Justification of choice of data or description of measurement methods and procedures applied	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ Where: $EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh) $EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM} = Weighting of build margin emissions factor (%) = 25%
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{PJ, y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
Source of data	Monthly Form-B issued by BESCOM
Description of measurement methods and	The Net electricity supplied to the grid by the solar plant in a given month = Export, kWh – Import, kWh. The Export & Import values for the particular month are available from the B-Forms.

⁶ https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver14.pdf

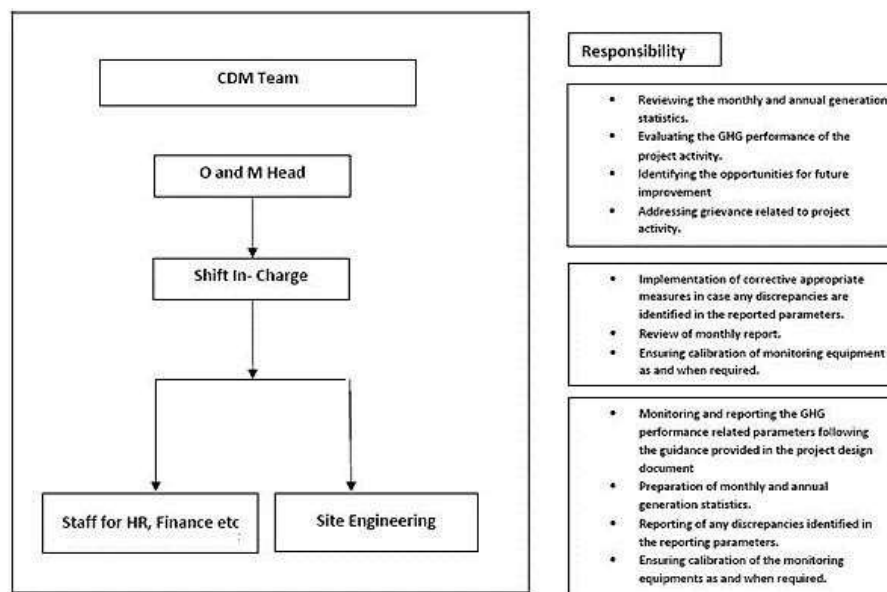
procedures to be applied	However, the Invoicing is done by deducting 115% of Import and transmission losses (if any) from the Export value. So, for the Emission Reduction calculations, the calculation of the Net Electricity should be done as Net Electricity = Export – 115% of Import – transmission losses (if any). This can be cross-checked from the monthly Invoices raised by the PP. The Invoice provides the monthly values of the Export & Import (as per B-Form), 115% Import (calculated from Import as per B-Form) and the transmission loss (if any).
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	25,869
Monitoring equipment	The electricity exported / supplied by the plant to pooling substation and further to substation. This meter also measures electricity imported by the plant from the grid.
QA/QC procedures to be applied	The meters is approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years⁷. The monthly electricity supplied/exported by the project activity in the Form-B is cross checked with the monthly Invoices. In the absence or delay in the meter calibration appropriate Guidelines will be applied appropriately to confirm the conservativeness of metering. The metering arrangement, accuracy class of meters, calibration frequency is under control of state electricity board and PP do not have any control on it. PP is getting value of net electricity supplied to grid and the same is considered the monitoring parameter. The billing is raised based on substation meters
Purpose of the data	Calculation of baseline emissions
Calculation method	Thus, Net electricity supplied to the grid by the project plant in agiven month = Export, kWh– 115% of Import, kWh– transmission loss (if any)
Comments	Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VCUs for thisproject activity, whichever occurs later

⁷ http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf

4.3 Monitoring Plan

The monitoring plan is developed in accordance with the modalities and procedures for VCS project activity and is proposed for grid-connected solar power project being implemented. The monitoring plan, which is 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 PP has formal team in place to keep a track of monitoring and invoicing of power generated from the project activity and regular internal audit is being done by competent authorities internally and in case of any non-conformities identified appropriate action are being taken to rectify and resolve the issues.

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the project participant. PP proposed the following structure for data monitoring, collection, data archiving and calibration of equipments for this project activity. The team comprises of the following members.



Data Measurement

The export and import energy is measured continuously using above mentioned Main and Check meters located at the substations. Readings of meters shall be taken on monthly basis by

authorized officer of SEB in the presence of PP or representative of PP. Based on the Meter Reading Statement to PP, invoices are raised. These invoices are used for cross checking the meter readings taken for the respective project activity.

Data collection and archiving

Readings from meters is collected in the presence of the plant in-charge. Export and Import data are recorded and stored in logs as well as in electronic form on a daily basis. The records are checked periodically by the Plant Manager and discussed thoroughly with the plant supervisor. The period of storage of the monitored data will be 2 years after the end of crediting period or till the last issuance of VCUs for the project activity whichever occurs later.

Emergency preparedness

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

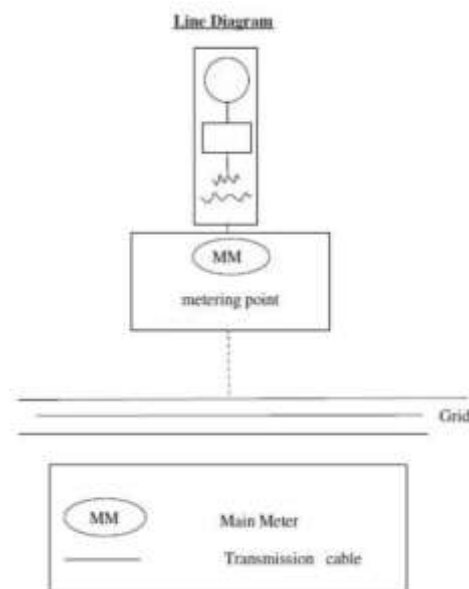
In the event that the main meter, which is used to record the net electricity exported by the project, is found to be faulty it will be repaired or replaced and the data from the check meter is used in its place. In the unlikely event that the check meter fails it will also be repaired or replaced.

Personnel training

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

Metering Arrangement

Line diagram with metering arrangement for the solar project activity is shown below



QA/QC procedures

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

Apportioning

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

Apportioning the net electricity exported to grid, as recorded in the consolidated Share Certificate / JMR Report / Credit Notes certified by the respective state discom, based on the number of days in the monitoring period and the number of days for which Share Certificate / JMR Report / Credit Notes was prepared.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

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

Where

BE_y :	Baseline emissions in year y (tCO_2e/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 VCS project activity in year y (MWh/yr)
$EF_{grid, CM, y}$:	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2e/MWh)

Parameter	Unit	Value
$EG_{PJ, y}$	MWh	25,869
$EF_{grid, CM, y}$	tCO_2e	0.9368
BE_y	=	$25,869 * 0.9368$
	=	24,224

5.2 Project Emissions

Not Applicable, since the project emissions from the solar project activity is zero as per AMS I.D. methodology

5.3 Leakage

Not Applicable, since the leakage emissions from the solar project activity is zero as per AMS I.D. methodology.

5.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2019	2,544	0	0	2,544
2020	14512	0	0	14512
2021	7168	0	0	7168
Total	24,224	0	0	24,224

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period is 38,397 tCO₂e, whereas actual emission reductions achieved are 24,224 tCO₂e, which is approximately 36.91% lower than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, which are not within the control of the project participant. The lower generation during the current verification period is due to certain natural conditions. Hence, it is acceptable.

APPENDIX 1: CALIBRATION DETAILS

Meter and Calibration details for Renewable Solar Power Project by Rishabh Renergy

Meter Details	Main Meter	Check Meter
Meter Serial No	18015358	17071186
Meter Make	L & T	L & T
Accuracy Class	0.2 s	0.2 s
Date of Calibration	27-March-2018	27-March-2018
Due date of next calibration	26-March-2023	26-March-2023

The Meters were calibrated on 27-March-2018. Since the calibration frequency of the meters are once in five year, the calibration is valid during the current monitoring period. Hence, no error factor has been applied due to delay in calibration.

APPENDIX 2: BREAKDOWN DETAILS

Month	Grid Downtime (Hr.)	Grid Availability	Plant Downtime (Hr.)	Plant Availability
Dec-19	3.6	98.9%	3.3	99.0%
Jan-20	0.2	99.9%	1.7	99.5%
Feb-20	0.0	100%	0.0	100%
Mar-20	0.2	99.9%	0.0	100%
Apr-20	0.0	100%	0.0	99.99%
May-20	2.4	99.29%	0.0	99.99%
Jun-20	4.0	98.97%	0.0	100%
Jul-20	0.0	100%	0.0	100%
Aug-20	5.3	98.68%	5.5	98.7%
Sep-20	5.5	98.58%	0.1	99.98%
Oct-20	3.6	98.98%	0.0	99.99%
Nov-20	3.0	99.10%	1.5	99.5%
Dec-20	6.1	98.13%	5.1	98.4%
Jan-21	0.2	99.9%	1.7	99.5%
Feb-21	0.0	100%	0.0	100%
Mar-21	0.2	99.9%	0.0	100%
Apr-21	0.0	100%	0.0	99.99%
May-21	2.4	99.29%	0.0	99.99%
Jun-21	4.0	98.97%	0.0	100%