



Renewable Solar Power Project by ReNew Solar Power Private Limited



Document Prepared by EKI Energy Services Limited

Project Title	Renewable Solar Power Project by ReNew Solar Power Private Limited
Version	2.0
Report ID	1851
Date of Issue	02-February-2022
Project ID	1851
Monitoring Period	26-May-2021 to 31-December-2021
Prepared By	Sushma Ramindla Executive Operations EKI Energy Services Limited
Contact	EnKing Embassy, Office No. 201, Plot 48, Scheme 78, Part 2, Vijay Nagar, Near brilliant Convention Centre, Indore- 452010 Madhya Pradesh, India Website: www.enkingint.org Email ID sushma@enkingint.org M: +91 6301143307

CONTENTS

1	PROJECT DETAILS.....	3
1.1	Summary Description of the Implementation Status of the Project	3
1.2	Sectoral Scope and Project Type	5
1.3	Project Proponent.	6
1.4	Other Entities Involved in the Project	6
1.5	Project Start Date	6
1.6	Project Crediting Period	6
1.7	Project Location	6
1.8	Title and Reference of Methodology	11
1.9	Participation under other GHG Programs.....	11
1.10	Other Forms of Credit.....	12
1.11	Sustainable Development.....	12
2	SAFEGUARDS	12
2.1	No Net Harm	12
2.2	Local Stakeholder Consultation	13
2.3	AFOLU-Specific Safeguards	13
3	IMPLEMENTATION STATUS	13
3.1	Implementation Status of the Project Activity	13
3.2	Deviations	22
3.3	Grouped Projects	23
4	DATA AND PARAMETERS.....	23
4.1	Data and Parameters Available at Validation	23
4.2	Data and Parameters Monitored.....	24
4.3	Monitoring Plan.....	29
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	31
5.1	Baseline Emissions	32
5.2	Project Emissions	33
5.3	Leakage.....	33
5.4	Net GHG Emission Reductions and Removals	33
	APPENDIX 1: CALIBRATION DETAILS	35

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 sources. The project activity involves total capacity of 927 MW solar power project which are installed in Gujarat, Karnataka, Madhya Pradesh, Rajasthan and Telangana states of India. The solar projects have been developed by the SPVs of ReNew Solar Power Private Limited.

Over the 10 years of first crediting period, the project replaces anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 1,767,281 tCO₂e per year, thereon displacing 1,865,216 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 and their location of installation are mentioned in the table below:-

Name of SPVs ¹	Capacity in MW	Date of Commissioning	Connection with Grid	State	Usage
Bhumi Prakash Private Limited	20 MW	26.09.2017	Indian Grid	Karnataka	Sale to State Discom
Renew Wind Energy (MP Four) Private Limited	20 MW	28.04.2017			Sale to State Discom
Renew Agni Power Private Limited	20 MW	31.03.2017			Sale to State Discom
Renew Wind Energy (Karnataka 3) Private Limited	20 MW	27.03.2017			Sale to State Discom
Tarun Kiran Bhoomi Private Limited	20 MW	31.03.2017			Sale to State Discom
Renew Wind Energy (Karnataka 4) Private Limited	20 MW	31.03.2017			Sale to State Discom
Renew Wind Energy (Budh 3) Private Limited	20 MW	16.03.2018			Sale to 3rd Party
Renew Wind Energy (Budh 3) Private Ltd	20 MW	09.03.2018			Sale to 3rd Party
Renew Wind Energy (Budh 3) Private Limited	20 MW	30.12.2017			Sale to 3rd Party

¹ The SPV names mentioned in the table are in accordance with their respective Commissioning Certificates.

Renew Wind Energy (Maharashtra) Private Limited	20 MW	13.10.2017			Sale to State Discom
Renew Wind Energy (Rajasthan Four) Private Limited	20 MW	07.12.2017			Sale to State Discom
Renew Wind Energy (MP Three) Private Limited	20 MW	11.11.2017			Sale to State Discom
Renew Saur Urja Private Limited	50 MW	26.05.2017			Sale to 3rd Party
Renew Wind Energy (TN2) Private Limited	50 MW	14.12.2017			Sale to NTPC Limited
Renew Solar Energy (Karnataka Two) Private Limited	40 MW	31.03.2017		Gujarat	Sale to SECI Limited
Renew Clean Energy Private Limited	51 MW	01.10.2017		Madhya Pradesh	Sale to State Discom
Aalok Solarfarms Limited	10 MW	06.11.2017			Sale to NTPC Limited
Abha Solarfarms Limited	10 MW	17.10.2017			Sale to NTPC Limited
Heramba Renewables Limited	20 MW	10 MW on 17.10.2017 10 MW on 28.10.2017		Rajasthan	Sale to NTPC Limited
Shreyas Solarfarms Limited	20 MW	17.11.2017			Sale to NTPC Limited
ReNew Solar Energy (Telangana) Private Limited	143 MW	44 MW on 28.04.2017 17.6 MW on 16.05.2017 44 MW on 22.06.2017 15.4 MW on 03.07.2017 22 MW on 12.07.2017		Telangana	Sale to State Discom
Renew Mega Solar Power Private Limited	48 MW	24 MW on 13.02.2017 24 MW on 21.02.2017			Sale to State Discom
Renew Saur Shakti Private Limited	30 MW	8 MW on 14.02.2017			Sale to State Discom

		10 MW on 04.03.2017			
		6 MW on 30.03.2017			
		4.5 MW on 30.05.2017			
		1.5 Mw on 11.06.2017			
Renew Saur Shakti Private Limited	65 MW	58 MW on 29.05.2017			Sale to State Discom
		7 MW on 07.07.2017			
Renew Wind Energy (TN2) Private Limited	100 MW	01.11.2017			Sale to NTPC Limited
Prathamesh Solarfarms Limited	50 MW	20.09.2017			Sale to State Discom
Total	927 MW				

All the SPVs are of ReNew Solar Power Private Limited. The project is promoted by ReNew Solar Power Private Limited.

Total emission reductions achieved in this monitoring period:

During the Current Monitoring Period from 26/05/2021 to 31/12/2021 (First and last date included) the project activity has supplied 996,714.89 MWh of electricity, and thus contributing to the GHG reductions 944,387 tCO₂e (Round down value).

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 ACM0002-Version 19.0²

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

- Tool to calculate the emission factor for an electricity system³- Version 07.0 (EB 100, Annex 04)
- Methodological Tool- Tool for the demonstration and assessment of additionality⁴- Version 07.0.0 (EB 70, Annex 08).

² <http://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD>

³ <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

⁴ <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

1.3 Project Proponent.

Organization name	Renew Solar Power Private Limited
Contact person	Mr. Aditya Sharma
Title	PP Representative
Address	ReNew Hub, Commercial Block-1, Zone 6, Golf Course Road, DLF City, Phase-V, Gurugram- 122009, Haryana
Telephone	+91-8800915324
Email	Aditya.Sharma@renewpower.in

1.4 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the Project	Project Consultant
Contact person	Sushma Ramindla
Title	Executive Operations
Address	EnKing Embassy, Office No. 201, Plot 48, Scheme 78, Part 2, Vijay Nagar, Near brilliant Convention Centre, Indore- 452010 Madhya Pradesh, India
Telephone	+91 6301143307
Email	sushma@enkingint.org // 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.13-02-2017 which is the date of commissioning of 24 MW solar project activity by Renew Mega Solar Power Private Limited.

1.6 Project Crediting Period

Crediting Period Start date: 13-February-2017

Crediting Period End date: 12-February-2027

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 are mentioned in the table below.

Name of SPVs	Capacity (MW)	Village(s)	Tehsil / Mandal	District	State
Bhumi Prakash Private Limited	20 MW	Hirebudur	Deodurga	Raichur	Karnataka
Renew Wind Energy (MP Four) Private Limited	20 MW	Chincholi	Chincholi	Kalaburagi	
Renew Agni Power Private Limited	20 MW	Upparhosahalli	Siruguppa	Ballari	

Renew Wind Energy (Karnataka 3) Private Limited	20 MW	Ladha	Bhalki	Bidar	
Tarun Kiran Bhoomi Private Limited	20 MW	Gola (B)	Aland	Kalaburagi	
Renew Wind Energy (Karnataka 4) Private Limited	20 MW	Nirna	Humnabad	Bidar	
Renew Wind Energy (Budh 3) Private Limited	20 MW	Santhpur near Eklara	Aurad	Bidar	
Renew Wind Energy (Budh 3) Private Limited	20 MW	Nirna	Humnabad	Bidar	
Renew Wind Energy (Budh 3) Private Limited	20 MW	Wadagere & Aikur	Shahapur	Yadagir	
Renew Wind Energy (Maharashtra) Private Limited	20 MW	Saidapur & Malhar	Yadagir	Yadagir	
Renew Wind Energy (Rajasthan Four) Private Limited	20 MW	Gundikaval	Turuvekere	Tumkur	
Renew Wind Energy (MP Three) Private Limited	20 MW	Kattige	Honnali	Davangere	
Renew Saur Urja Private Limited	50 MW	Thalekhan	Lingasugur		
Renew Wind Energy (TN2) Private Limited	50 MW	Thirumani, Rayacherlu, Vallur, Balasamudra, Kyataganacherlu	NagalamadikeHobli , Pavagada	Tumkur	
Renew Solar Energy (Karnataka Two) Private Limited	40 MW	Charanka	Santalpur	Patan	Gujarat
Renew Clean Energy Private Limited	51 MW	Bhensarwas	Shadora	Ashok Nagar	Madhya Pradesh
Aalok Solarfarms Limited	10 MW	Badisid	Bap	Jodhpur	Rajasthan
Abha Solarfarms Limited	10 MW	Badisid	Bap	Jodhpur	
Heramba Renewbles Limited	20 MW	Hanawat Nagar	Bap	Jodhpur	
Shreyas Solarfarms Limited	20 MW	Khetusar Nagar	Bap	Jodhpur	
ReNew Solar Energy (Telangana) Private Limited	143 MW	Dharamaraopet & Kankal	Sadasivanagar	Nizamabad	Telangana

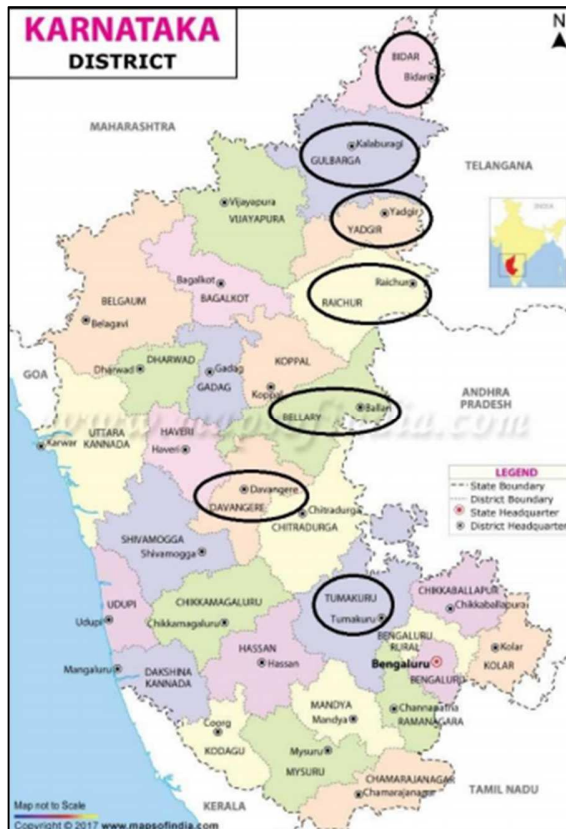
Renew Mega Solar Power Pvt Limited	48 MW	Andugulapet	Mandamarri	Adilabad	
Renew Saur Shakti Private Limited	30 MW	Vangara	Bheemdevarapally	Karimnagar	
Renew Saur Shakti Private Limited	65 MW	Minpur	-	Medak	
Renew Wind Energy (TN2) Private Limited	100 MW	Gudibanda	Addakal	Mahabubnagar	
Prathamesh Solarfarms Limited	50 MW	Dodaguntapally	Peddmandadi	Mahabubnagar	

The Geo-coordinates of the project site is mentioned below:

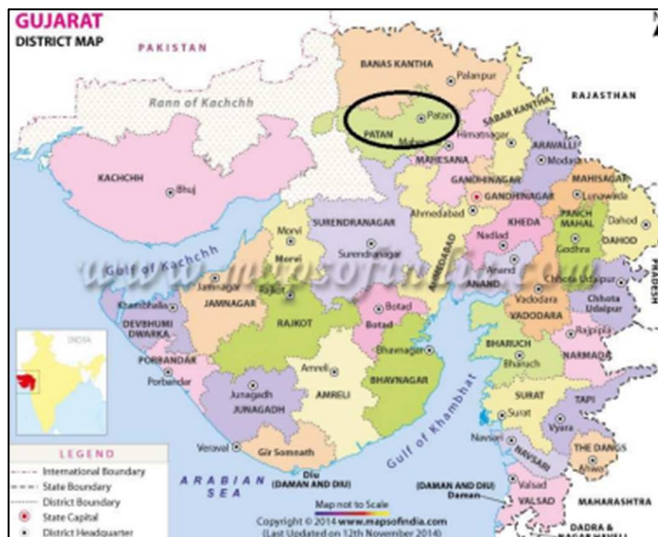
Name of SPVs	Capacity (MW)	Latitude	Longitude
Bhumi Prakash Private Limited	20 MW	16.3° N	76.8° E
Renew Wind Energy (MP Four) Private Limited	20 MW	17.4° N	77.4° E
Renew Agni Power Private Limited	20 MW	15.5° N	76.9° E
Renew Wind Energy (Karnataka 3) Private Limited	20 MW	18° 0'5.81"N	77°18'32.57"E
Tarun Kiran Bhoomi Private Limited	20 MW	17.4° N	76.7° E
Renew Wind Energy (Karnataka 4) Private Limited	20 MW	17.7° N	77.3° E
Renew Wind Energy (Budh 3) Private Limited	20 MW	18°11'47.91"N	77°26'46.34"E
Renew Wind Energy (Budh 3) Private Limited	20 MW	17.75° N	77.35° E
Renew Wind Energy (Budh 3) Private Limited	20 MW	16.6° N	77.0°E
Renew Wind Energy (Maharashtra) Private Limited	20 MW	16.6° N	77.3°E
Renew Wind Energy (Rajasthan Four) Private Limited	20 MW	13.2°N	76.8°E
Renew Wind Energy (MP Three) Private Limited	20 MW	14.3° N	75.6° E
Renew Saur Urja Private Limited	50 MW	15°53'53" N	76°33'26" E
Renew Wind Energy (TN2) Private Limited	50 MW	14.237 N	77.486 E
Renew Solar Energy (Karnataka Two) Private Limited	40 MW	23°54'56.45" N	71°12'4.79" E
Renew Clean Energy Private Limited	51 MW	24.03117°N	76.667943°E
AalokSolarfarms Limited	10 MW	27.4° N	72.4° E
AbhaSolarfarms Limited	10 MW	27.4° N	72.4° E
HerambaRenewables Limited	20 MW	27.4° N	72.1° E
ShreyasSolarfarms Limited	20 MW	27.3° N	71.9° E
ReNew Solar Energy (Telangana) Private Limited	143 MW	N 18.6°	E 78.3°
Renew Mega Solar Power Pvt Limited	48 MW	N 18.985290°	E 79.446397°
Renew Saur Shakti Private Limited	30 MW	18.1° N	79.4° E
Renew Saur Shakti Private Limited	65 MW	17° 57.951' N	78° 03.968' E
Renew Wind Energy (TN2) Private Limited	100 MW	16.6°N	77.9°E
PrathameshSolarfarms Limited	50 MW	16°25'12" N	78°4'40.80" E

The project locations have been shown in the maps below:

Karnataka Site:



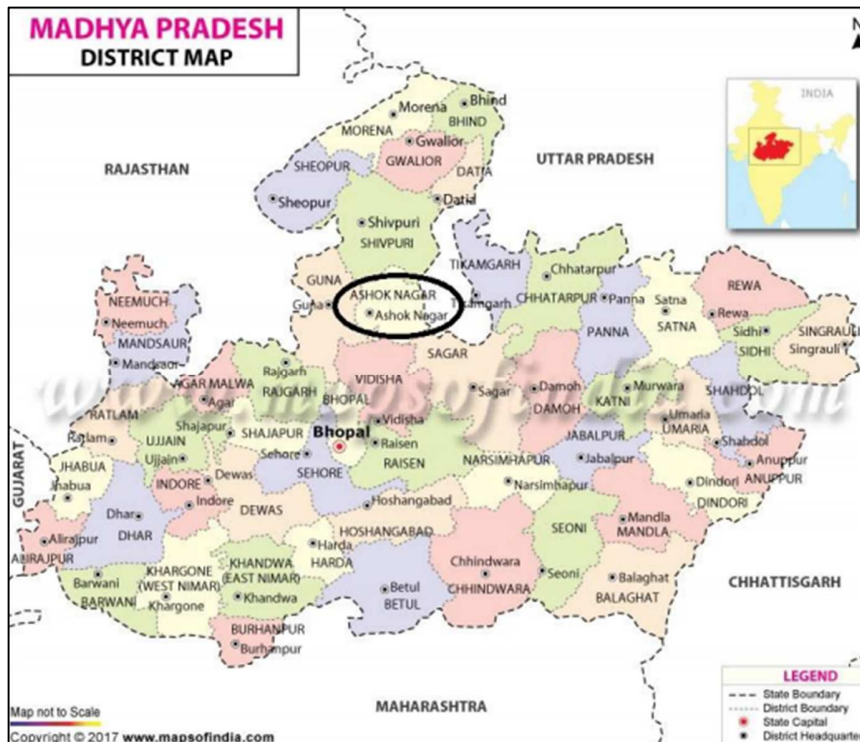
Gujarat Site:



Rajasthan Site:



Madhya Pradesh Site:



Telangana Site:



1.8 Title and Reference of Methodology

Title: Grid-connected electricity generation from renewable sources

Reference: The project activity meets the eligibility criteria of large-scale project as it is more than 15 MW

Methodology: ACM0002: Grid-connected electricity generation from renewable sources⁵ - Version 19.0

Type I: Energy industries (renewable / non-renewable sources)

Category: Approved Consolidated Methodology (ACM0002)

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

- Tool to calculate the emission factor for an electricity system⁶- Version 07.0 (EB 100, Annex 04)
- Methodological Tool- Tool for the demonstration and assessment of additional⁷- Version 07.0.0 (EB 70, Annex 08).

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.

⁵ <http://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD>

⁶ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

⁷ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

1.10 Other Forms of Credit

Emission Trading Programs and Other Binding Limits:

Net GHG emission reductions or removals generated by the project are not being used for compliance with an emissions trading program or to meet binding limits on GHG emissions in any Emission Trading program or other binding limits.

Other Forms of Environmental Credit:

Not applicable, as the project is not registered in any other GHG mechanism other than VCS. Also, the project activity is not availing any REC benefits and the same can be confirmed from publicly available link of REC generators.

Web-link: https://www.recregistryindia.nic.in/index.php/general/publics/registered_regens

1.11 Sustainable Development

Contribution to sustainable development:

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 helps 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 helps to reduce the demand supply gap in the state.

Technological well-being: The successful operation of project activity leads to promotion of solar power generation and encourages 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.

2 SAFEGUARDS

2.1 No Net Harm

The project activity does not involve any major construction activity. It primarily requires the installation of the solar PV panels, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories.

The report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013. This report clearly mentioned that solar PV project activity operations do not result in direct air pollution, noise pollution. Please refer below web link for the same⁸.

Thus there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity. Also, there is no any negative environmental and socio-economic impacts due to implementation of the project activity as this is a renewable solar project.

2.2 Local Stakeholder Consultation

The local stakeholder meeting was carried out for the project activity and the details of the same can be referred from the registered VCS PD.

As a part of continuous feedback from stakeholders, the PP also placed a grievance register onsite where-in, the stakeholders can put down their complaint and the same if found genuine are addressed immediately. However, during the current monitoring period, no comments or feedbacks were received.

2.3 AFOLU-Specific Safeguards

Not Applicable, as this is not an AFOLU project.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity involves the installation of solar project. The total installed capacity of the project is 927 MW Solar project located at Gujarat, Karnataka, Madhya Pradesh, Rajasthan and Telangana states in India. The project is promoted by ReNew Solar Power Private Limited.

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.

During the Current Monitoring Period, all the solar plants were operational and the project activity has supplied 996,714.89 MWh of electricity, and thus contributing to the GHG reductions 944,387 tCO₂e (Round down value).

⁸ <http://mnre.gov.in/file-manager/UserFiles/report-on-developmental-impacts-of-RE.pdf>

The technical details of the project activity are provided below.

The technical specification for 20 MW solar project by Bhumi Prakash Private Limited at Karnataka.

Sl. No.	Technical details of the equipment ⁹	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp, 325 Wp No. of Modules- 21, 21
2	Number of Inverters & Capacity	20 Inverters Capacity- 1 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 15/20 MVA

The technical specification for 20 MW solar project by Renew Wind Energy (MP Four) Private Limited at Karnataka.

Sl. No.	Technical details of the equipment ¹⁰	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp No. of Modules- 21
2	Number of Inverters & Capacity	20 Inverters Capacity- 1 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 16/20 MVA

The technical specification for 20 MW solar project by Renew Agni Power Private Limited at Karnataka.

Sl. No.	Technical details of the equipment ¹¹	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp, 320 Wp & 325 Wp No. of Modules- 21,21,21
2	Number of Inverters & Capacity	465 Inverters Capacity- 0.043 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 16/20 MVA

⁹ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

¹⁰ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

¹¹ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

The technical specification for 20 MW solar project by Renew Wind Energy (Karnataka 3) Private Limited at Karnataka.

Sl. No.	Technical details of the equipment ¹²	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp, 320 Wp & 325 Wp No. of Modules- 21,21,21
2	Number of Inverters & Capacity	465 Inverters Capacity- 1 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 16/20 MVA

The technical specification for 20 MW solar project by Tarun Kiran Bhoomi Private Limited at Karnataka.

Sl. No.	Technical details of the equipment ¹³	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp, 320 Wp No. of Modules- 21,21
2	Number of Inverters & Capacity	8 Inverters Capacity- 2.5 MW
3	Number of Transformers & Capacity	4 transformer of 4 MVA 1 transformer of 16/20 MVA

The technical specification for 20 MW solar project by Renew Wind Energy (Karnataka 4) Private Limited at Karnataka.

Sl. No.	Technical details of the equipment ¹⁴	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp, 320 Wp & 325 Wp No. of Modules- 20,20,20
2	Number of Inverters & Capacity	20 Inverters Capacity- 1 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 16/20 MVA

¹² It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

¹³ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

¹⁴ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

The technical specification for 20 MW solar project by Renew Wind Energy (Budh 3) Private Limited at Eklara site in Karnataka.

Sl. No.	Technical details of the equipment ¹⁵	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp, 325 Wp & 330 Wp No. of Modules- 20,20,20
2	Number of Inverters & Capacity	8 Inverters Capacity- 2.52 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 16/20 MVA

The technical specification for 20 MW solar project by Renew Wind Energy (Budh 3) Private Limited at Nirna site in Karnataka.

Sl. No.	Technical details of the equipment ¹⁶	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp, 325 Wp & 330 Wp No. of Modules- 20,20,20
2	Number of Inverters & Capacity	8 Inverters Capacity- 2.52 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 16/20 MVA

The technical specification for 20 MW solar project by Renew Wind Energy (Budh 3) Private Limited at Wadagere site in Karnataka.

Sl. No.	Technical details of the equipment ¹⁷	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp, 325 Wp & 330 Wp No. of Modules- 20,20,20
2	Number of Inverters & Capacity	30 Inverters Capacity- 0.68 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 15/20 MVA

¹⁵ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

¹⁶ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

¹⁷ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

The technical specification for 20 MW solar project by Renew Wind Energy (Maharashtra) Private Limited at Karnataka

Sl. No.	Technical details of the equipment ¹⁸	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp, 320 Wp& 325Wp No. of Modules- 21,21,21
2	Number of Inverters & Capacity	30 Inverters Capacity- 0.68 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 15/20 MVA

The technical specification for 20 MW solar project by Renew Wind Energy (Rajasthan Four) Private Limited at Karnataka.

Sl. No.	Technical details of the equipment ¹⁹	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp& 325Wp No. of Modules- 21,21
2	Number of Inverters & Capacity	20 Inverters Capacity- 1 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 16/20 MVA

The technical specification for 20 MW solar project by Renew Wind Energy (MP Three) Private Limited at Karnataka.

Sl. No.	Technical details of the equipment ²⁰	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp, 325 Wp& 330Wp No. of Modules- 21,21,21
2	Number of Inverters & Capacity	20 Inverters Capacity- 1 MW
3	Number of Transformers & Capacity	5 transformer of 4 MVA 1 transformer of 15/20 MVA

¹⁸It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

¹⁹It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

²⁰It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 20 MW.

The technical specification for 50 MW solar project by Renew Saur Urja Private Limited at Karnataka

Sl. No.	Technical details of the equipment ²¹	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp, 320 Wp& 325Wp No. of Modules- 21,42,21
2	Number of Inverters & Capacity	23 Inverters of 1 MW 24 Inverters of 1.125 MW
3	Number of Transformers & Capacity	6 transformer of 4.5 MVA 5 transformer of 4 MVA 1 transformer of 3 MVA 2 transformers of 20/25 MVA

The technical specification for 50 MW solar project by Renew Wind Energy (TN2) Private Limited at Karnataka.

Sl. No.	Technical details of the equipment ²²	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp, 325 Wp, 330 Wp, 340 Wp& 345 Wp No. of Modules- 19,21,21,21,21
2	Number of Inverters & Capacity	20 Inverters of 2.5 MW
3	Number of Transformers & Capacity	10 transformers of 5 MVA 2 transformers of 20/25 MVA

The technical specification for 40 MW solar project by Renew Solar Energy (Karnataka Two) Private Limited at Gujarat.

Sl. No.	Technical details of the equipment ²³	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp, 320 Wp& 325 Wp No. of Modules- 20,20,20
2	Number of Inverters & Capacity	40 Inverters of 1 MW
3	Number of Transformers & Capacity	10 transformers of 4 MVA

²¹It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 50 MW.

²²It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 50 MW.

²³It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 40 MW.

		2 transformers of 16/20 MVA
--	--	-----------------------------

The technical specification for 51 MW solar project by Renew Clean Energy Private Limited at Madhya Pradesh.

Sl. No.	Technical details of the equipment ²⁴	Description
1	Modules capacity and No. of Module	Model capacity- 117.5 Wp No. of Modules- 32
2	Number of Inverters & Capacity	6 Inverters of 2.5 MW 12 Inverters of 3 MW
3	Number of Transformers & Capacity	6 transformers of 6 MVA 3 transformers of 5 MVA 2 transformers of 25/30 MVA

The technical specification for 10 MW solar project by Aalok Solarfarms Limited at Rajasthan.

Sl. No.	Technical details of the equipment ²⁵	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp No. of Modules- 20
2	Number of Inverters & Capacity	10 Inverters of 1 MW
3	Number of Transformers & Capacity	5 transformers of 2 MVA

The technical specification for 10 MW solar project by Abha Solarfarms Limited at Rajasthan.

Sl. No.	Technical details of the equipment ²⁶	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp No. of Modules- 20
2	Number of Inverters & Capacity	10 Inverters of 1 MW
3	Number of Transformers & Capacity	5 transformers of 2 MVA

The technical specification for 20 MW solar project by Heramba Renewbles Limited at Rajasthan.

²⁴It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 51 MW.

²⁵It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 10 MW.

²⁶It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 10 MW.

Sl. No.	Technical details of the equipment ²⁷	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp No. of Modules- 20
2	Number of Inverters & Capacity	10 Inverters of 1 MW
3	Number of Transformers & Capacity	10 transformers of 2 MVA

The technical specification for 20 MW solar project by Shreyas Solarfarms Limited at Rajasthan.

Sl. No.	Technical details of the equipment ²⁸	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp No. of Modules- 20
2	Number of Inverters & Capacity	10 Inverters of 1 MW
3	Number of Transformers & Capacity	10 transformers of 2 MVA

The technical specification for 143 MW solar project by ReNew Solar Energy (Telangana) Private Limited at Telangana.

Sl. No.	Technical details of the equipment ²⁹	Description
1	Modules capacity and No. of Module	Model capacity- 310 Wp, 315 Wp, 320 Wp & 325 Wp No. of Modules- 21,21,21,21
2	Number of Inverters & Capacity	130 Inverters of 1 MW
3	Number of Transformers & Capacity	31 transformers of 4.4 MVA 3 transformers of 2.2 MVA 3 transformers of 40/50 MVA

The technical specification for 48 MW solar project by Renew Mega Solar Power Private Limited at Telangana.

Sl. No.	Technical details of the equipment ³⁰	Description
---------	--	-------------

²⁷It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 10 MW.

²⁸It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 10 MW.

²⁹It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 143 MW.

³⁰It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 48 MW.

1	Modules capacity and No. of Module	Model capacity- 310 Wp, 315 Wp& 320 Wp No. of Modules- 21,21,21
2	Number of Inverters & Capacity	48 Inverters of 1 MW
3	Number of Transformers & Capacity	12 transformers of 4 MVA 2 transformers of 25/30 MVA

The technical specification for 30 MW solar project by Renew Saur Shakti Private Limited at Telangana.

Sl. No.	Technical details of the equipment ³¹	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp No. of Modules- 21
2	Number of Inverters & Capacity	30 Inverters of 1 MW
3	Number of Transformers & Capacity	7 transformers of 4 MVA 1 transformers of 2 MVA 1 transformers of 25/30 MVA

The technical specification for 65 MW solar project by Renew Saur Shakti Private Limited at Telangana.

Sl. No.	Technical details of the equipment ³²	Description
1	Modules capacity and No. of Module	Model capacity- 315 Wp, 320 Wp& 325 Wp No. of Modules- 42,84,42
2	Number of Inverters & Capacity	65 Inverters of 1 MW
3	Number of Transformers & Capacity	16 transformers of 4 MVA 1 transformers of 1 MVA 1 transformers of 25/30 MVA 1 transformers of 40/50 MVA

The technical specification for 100 MW solar project by Renew Wind Energy (TN2) Private Limited at Telangana.

Sl. No.	Technical details of the equipment ³³	Description
---------	--	-------------

³¹It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 30 MW.

³²It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 65 MW.

³³It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 100 MW.

1	Modules capacity and No. of Module	Model capacity- 320 Wp, 325 Wp& 330 Wp No. of Modules- 60,60,60
2	Number of Inverters & Capacity	28 Inverters of 2.5 MW 30 Inverters of 1 MW
3	Number of Transformers & Capacity	6 transformers of 4 MVA 3 transformers of 2 MVA 14 transformers of 5 MVA 2 transformers of 40/50 MVA

The technical specification for 50 MW solar project by Prathamesh Solar farms Limited at Telangana.

Sl. No.	Technical details of the equipment ³⁴	Description
1	Modules capacity and No. of Module	Model capacity- 320 Wp& 325 Wp No. of Modules- 20,20
2	Number of Inverters & Capacity	50 Inverters of 1 MW
3	Number of Transformers & Capacity	12 transformers of 4 MVA 2 transformers of 1 MVA

3.2 Deviations

2.2.1 Methodology Deviations

Not Applicable, as there are no methodological deviations.

2.2.2 Project Description Deviations

For the SPV- Renew Wind Energy (TN2) Private Limited, 50 MW Pavagada site, the source of data for the generation data was Form-B and the same has been considered as the source of generation data till Jan-2020. From Jan-2020 onwards, REA statements are being issued. Hence, the generation data from Jan-2020 onwards has been taken from the REA statements. The change in source of data for the generation is as per the requirement of State electricity authority and PP has no role to play in it. Therefore, PP applied for deviation from the source of data for generation from the registered PD.

The above mentioned deviation was approved during the previous verification and the same is being followed during the current verification period. It is to be noted that, due to this deviation, there is no any impact on the applicability of the methodology, additionality or the baseline scenario of the project activity.

³⁴It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 50 MW.

3.3 Grouped Projects

Not Applicable, as this is not a grouped project activity.

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 13, June 2018 ³⁵
Value applied	0.9726
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 07” as 3-year generation weighted average using data for the years 2014-15, 2015-16 & 2016-17. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 13, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the baseline emission
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 13, June 2018 ³⁶
Value applied	0.8723
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 07” as per the latest data available for the most recent year 2016-17. The data is obtained from “CO ₂ Baseline Database for Indian Power Sector” version 13, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	EF_{grid,CM,y}
------------------	-------------------------------

³⁵http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

³⁶http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

Data unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 13, June 2018 ³⁷
Value applied	0.9475
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

For Karnataka Site

Data / Parameter	EG _{PJ, y,KA}
Data unit	MWh/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
Source of data	Monthly joint meter reading reports
Description of measurement methods and procedures to be applied	The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value is considered for ER calculations.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	364,361.38 MWh
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 years. The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines are

³⁷http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

	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 a given month = Export, kWh– Import, kWh. If share certificate/JMR mentioned only net electricity export to grid, and does not mention any export and import separately, then net electricity supplied to grid is considered directly.
Comments	Data archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.

For Gujarat Site

Data / Parameter	EG_{PJ, y,GJ}
Data unit	MWh/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
Source of data	Monthly joint meter reading reports
Description of measurement methods and procedures to be applied	The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value is considered for ER calculations.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	50,385.88 MWh
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 years. The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines are 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.
Purpose of the data	The billing is raised based on substation meters. Calculation of baseline emissions
Calculation method	Thus, Net electricity supplied to the grid by the project plant in a given month = Export, kWh– Import, kWh. If share certificate/JMR mentioned only net electricity export to grid, and does not mention any export and import separately, then net electricity supplied to grid is considered directly.
Comments	Data is archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.

For Madhya Pradesh Site

Data / Parameter	EG _{PJ, y, MP}
Data unit	MWh/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
Source of data	Monthly joint meter reading reports
Description of measurement methods and procedures to be applied	The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value is considered for ER calculations.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	52,282.36 MWh
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 years. The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines are 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 a given month = Export, kWh– Import, kWh. If share certificate/JMR mentioned only net electricity export to grid, and does not mention any export and import separately, then net electricity supplied to grid is considered directly.
Comments	Data is archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.

For Rajasthan Site

Data / Parameter	EG_{PJ, y,RJ}
Data unit	MWh/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
Source of data	Monthly joint meter reading reports
Description of measurement methods and procedures to be applied	The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value is considered for ER calculations.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	83,764.85 MWh
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 years. The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines are 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 a given month = Export, kWh– Import, kWh. If share certificate/JMR mentioned only net electricity export to grid,

	and does not mention any export and import separately, then net electricity supplied to grid is considered directly.
Comments	Data is archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.

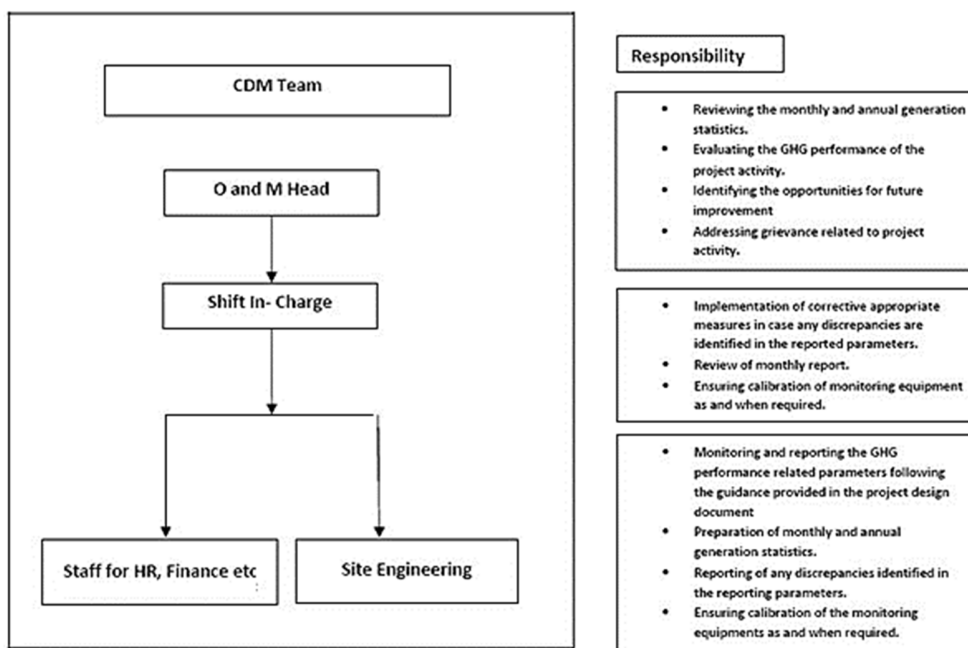
For Telangana Site

Data / Parameter	EG_{PJ, y, TL}
Data unit	MWh/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
Source of data	Monthly joint meter reading reports
Description of measurement methods and procedures to be applied	The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value is considered for ER calculations.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	445,920.42 MWh
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 years. The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines are 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 a given month = Export, kWh– Import, kWh. If share certificate/JMR mentioned only net electricity export to grid, and does not mention any export and import separately, then net electricity supplied to grid is considered directly.
Comments	Data is archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.

4.3 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 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 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 are 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 can be used for cross checking the meter readings taken for the respective project activity.

Data collection and archiving

Readings from meters are collected in the presence of the plant in-charge. Export and Import data would be 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 is 2 years after the end of crediting period or till the last issuance of VERs 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.

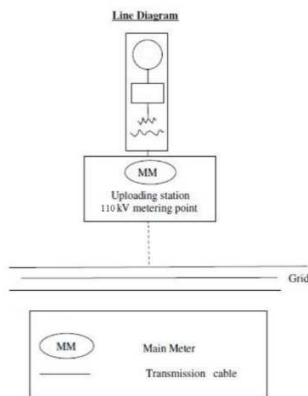
Personnel training

In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the staff is 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.

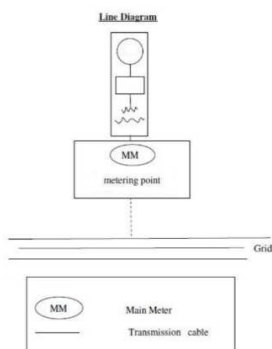
Metering Arrangement

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

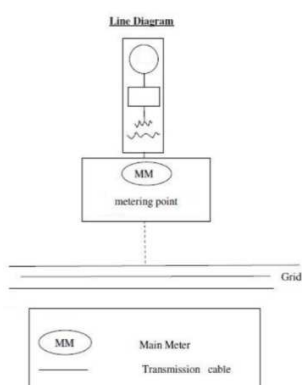
For Karnataka Site



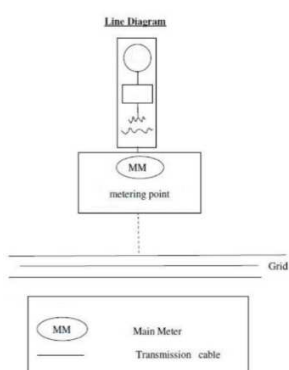
For Rajasthan Site



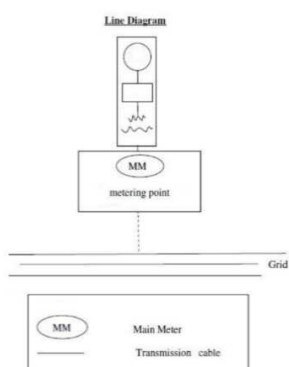
For Telangana Site



For Madhya Pradesh Site



For Gujarat Site



5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

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

Where:

BE_y : Baseline emissions in year y (tCO₂e/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 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" (tCO₂e/MWh).

To calculate $EG_{PJ,y}$:

$$EG_{PJ,y} = EG_{PJ,y,KA} + EG_{PJ,y,GJ} + EG_{PJ,y,MP} + EG_{PJ,y,RJ} + EG_{PJ,y,TL}$$

For Karnataka Sites:

$EG_{PJ,y,KA}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh (For the Karnataka site)

The net electricity supplied to the grid is calculated as the difference between the total electricity supplied to the grid and 115% of the total electricity imported from the grid i.e.

$$EG_{PJ,y,KA} = \text{Export (MWh)} - 115\% * \text{Import (MWh)} \quad (\text{Where applicable})$$

For Gujarat sites:

$EG_{PJ,y,GJ}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh (For the Gujarat site)

The net electricity supplied to the grid is calculated as the difference between the total electricity supplied to the grid and total electricity imported from the grid i.e.

$$EG_{PJ,y,GJ} = \text{Export (MWh)} - \text{Import (MWh)}$$

For Madhya Pradesh Sites:

$EG_{PJ,y,MP}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh (For the Madhya Pradesh site)

The net electricity supplied to the grid is calculated as the difference between the total electricity supplied to the grid and total electricity imported from the grid i.e.

$$EG_{PJ,y,MP} = \text{Export (MWh)} - \text{Import (MWh)}$$

For Rajasthan Sites:

$EG_{PJ,y,RJ}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh (For the Rajasthan site)

The net electricity supplied to the grid is calculated as the difference between the total electricity supplied to the grid and total electricity imported from the grid i.e.

$$EG_{PJ,y,MP} = \text{Export (MWh)} - \text{Import (MWh)}$$

For Telangana Sites:

$EG_{PJ, y, TL}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh (For the Telangana site)

The net electricity supplied to the grid is calculated as the difference between the total electricity supplied to the grid and total electricity imported from the grid i.e.

$$EG_{PJ, y, TL} = \text{Export} - \text{Import (MWh)}$$

Hence:

$$EG_{PJ, y} = 364,361.38 + 50,385.88 + 52,282.36 + 83,764.85 + 445,920.42$$

$$EG_{PJ, y} = 996,714.89 \text{ (MWh)}$$

Total Baseline emission for the Monitoring period:

Parameter	Unit	Value
$EG_{PJ, y}$	MWh	996,714.89
$EF_{grid, CM, y}$	tCO ₂ e/MWh	0.9475
BE_y	=	$996,714.89 * 0.9475$
	=	944,387 (Round down)

$$BE_y = 944,387 \text{ tCO}_2\text{e (Round down value)}$$

5.2 Project Emissions

Not Applicable, since project emissions from the solar project activity is zero as per ACM0002 methodology. Hence, $PE_y = 0$.

5.3 Leakage

Not Applicable, since leakage emissions from the solar project activity is zero as per ACM0002 methodology. Hence, $LE_y = 0$.

5.4 Net GHG Emission Reductions and Removals

Emission Reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in the year y (tCO₂e/yr)

BE_y = Baseline emissions in the year (tCO₂e/yr)

PE_y = Project emissions in the year y (tCO₂e/yr)

Baseline emissions:

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

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).

$$BE_y = 996,714.89 \text{ MWh} * 0.9475 \text{ tCO}_2e/\text{MWh}$$

$$BE_y = 944,387 \text{ tCO}_2e \text{ (Round down)}$$

As per the ACM0002 methodology, Project emissions (PE_y) are Zero.

Hence,

$$ER_y = BE_y - PE_y$$

$$ER_y = 944,387 \text{ tCO}_2e \text{ (Round down)}$$

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)
26-May-2021 to 31-December-2021	944,387	0	0	944,387
Total	944,387	0	0	944,387

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 1,065,210 tCO_2e , whereas actual emission reductions achieved are 944,387 tCO_2e , which is approximately 11.34% 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

The details of the energy meters and their calibration details are provided in the table below.

Name of SPVs	Capacity in MW	Meter Serial No.	Accuracy Class	Make	Date of Calibration	Due date of calibration ³⁸
Bhumi Prakash Private Limited	20 MW	Main Meter-15197833	0.2 s	L & T	23.09.2017	22.09.2022
		Check Meter-15197834	0.2 s	L & T	23.09.2017	
Renew Wind Energy (MP Four) Private Limited	20 MW	Main Meter-16083161	0.2 s	L & T	20.04.2017	19.04.2022
		Check Meter-16083118	0.2 s	L & T	20.04.2017	
Renew Agni Power Private Limited	20 MW	Main Meter-16113386	0.2 s	L & T	21.02.2017	20.02.2022
		Check Meter-16113401	0.2 s	L & T	21.02.2017	
Renew Wind Energy (Karnataka 3) Private Limited	20 MW	Main Meter-16113413	0.2 s	L & T	05.02.2017	04.02.2022
		Check Meter-16113221	0.2 s	L & T	05.02.2017	
Tarun Kiran Bhoomi Private Limited ³⁹	20 MW	Old Main Meter-15197833	0.2 s	L & T	12.02.2017	03.09.2024
		Old Check Meter-15197834	0.2 s	L & T	12.02.2017	
		New Main Meter-16193095	0.2 s	L & T	04.09.2019	
		New Check Meter-13192165	0.2 s	L & T	04.09.2019	
Renew Wind Energy (Karnataka 4) Private Limited	20 MW	Main Meter-16083139	0.2 s	L & T	06.03.2017	05.03.2022
		Check Meter-16083133	0.2 s	L & T	06.03.2017	
Renew Wind Energy (Budh 3) Private Limited	20 MW	Main Meter-17069178	0.2 s	L & T	23.02.2018	22.03.2023
		Check Meter-17069183	0.2 s	L & T	23.02.2018	
Renew Wind Energy (Budh 3) Private Ltd	20 MW	Main Meter-17166928	0.2 s	L & T	14.02.2018	13.02.2023
		Check Meter-17166940	0.2 s	L & T	14.02.2018	

³⁸At the time of commissioning, newly calibrated meters were installed. Also, the calibration frequency is once in five years, the calibrations are valid during the current monitoring period. Hence, no delay in error factor is applicable, during the current monitoring period.

³⁹ The newly calibrated main & check meters were installed on 04.09.2019.

Renew Wind Energy (Budh 3) Private Limited	20 MW	Main Meter-16113377	0.2 s	L & T	20.12.2017	19.12.2022
		Check Meter-16113373	0.2 s	L & T	20.12.2017	
Renew Wind Energy (Maharashtra) Private Limited	20 MW	Main Meter-16113430	0.2 s	L & T	30.06.2017	29.06.2022
		Check Meter-16113436	0.2 s	L & T	30.06.2017	
Renew Wind Energy (Rajasthan Four) Private Limited	20 MW	Main Meter-16112918	0.2 s	L & T	27.09.2017	26.09.2022
		Check Meter-16112913	0.2 s	L & T	27.09.2017	
Renew Wind Energy (MP Three) Private Limited	20 MW	Main Meter-16112933	0.2 s	L & T	27.09.2017	26.09.2022
		Check Meter-16112921	0.2 s	L & T	27.09.2017	
Renew Saur Urja Private Limited	50 MW	Old Main Meter-16083197	0.2 s	L & T	27.04.2017	26.04.2022
		Old Check Meter- 16083162	0.2 s	L & T	27.04.2017	
		New Main Meter-17117926	0.2 s	L & T	27.04.2017	26.04.2022
		New Check Meter- 17117928	0.2 s	L & T	27.04.2017	
Renew Wind Energy (TN2) Private Limited	50 MW	Main Meter-16195517	0.2 s	L & T	08.12.2017	07.12.2022
		Check Meter-16195508	0.2 s	L & T	08.12.2017	
		Main Meter-16195519	0.2 s	L & T	08.12.2017	
		Check Meter-16195523	0.2 s	L & T	08.12.2017	
Renew Solar Energy (Karnataka Two) Private Limited	40 MW	10195523	0.2 s	Secure	20.03.2017	19.03.2022
Renew Clean Energy Private Limited	51 MW	XE518730 XE518731	0.2 s	Secure	25.05.2017	24.05.2022
Aalok Solarfarms Limited	10 MW	17075514	0.2 s	L & T	08.08.2017	07.08.2022
Abha Solarfarms Limited	10 MW	17075486	0.2 s	L & T	04.08.2017	03.08.2022
Heramba Renewables Limited	20 MW	17075537	0.2 s	L & T	04.08.2017	03.08.2022
		17075547	0.2 s	L & T	04.08.2017	
Shreyas Solarfarms Limited	20 MW	17075525	0.2 s	L & T	04.08.2017	03.08.2022
		17075530	0.2 s	L & T	04.08.2017	
	143 MW	Main Meter - APX01166	0.2 s	Secure	20.10.2021	19.10.2022

Renew Solar Energy(Telangana) private Limited		Check Meter-APX01167	0.2 s	Secure	20.10.2021	
		Standby Meter-APX01168	0.2 s	Secure	20.10.2021	
Renew Mega Solar Power Private Limited	48 MW	Main Meter-APX01147	0.2 s	Secure	10.01.2017	09.01.2022
		Check Meter-APX01148	0.2 s	Secure	10.01.2017	
		Standby Meter-APX01149	0.2 s	Secure	10.01.2017	
Renew Saur Shakti Private Limited	30 MW	Main Meter-16196362	0.2 s	L & T	10.01.2017	10.01.2022
		Check Meter-16196398	0.2 s	L & T	10.01.2017	
		Standby Meter-16196385	0.2 s	L & T	10.01.2017	
Renew Saur Shakti Private Limited	65 MW	Main Meter-16196322	0.2 s	L & T	11.01.2017	10.01.2022
		Check Meter-16196377	0.2 s	L & T	11.01.2017	
		Standby Meter-16196411	0.2 s	L & T	11.01.2017	
Renew Wind Energy (TN2) Private Limited	100 MW	Main Meter-APZ00378	0.2 s	Apex 150	08.10.2017	09.10.2022
		Check Meter-APZ00379	0.2 s	Apex 150	08.10.2017	
		Standby Meter-APZ00380	0.2 s	Apex 150	08.10.2017	
Prathamesh Solarfarms Limited	50 MW	Main Meter-XD551233	0.2 s	Secure	18.09.2017	17.09.2022
		Check Meter-XD551234	0.2 s	Secure	18.09.2017	
		Standby Meter-XD551235	0.2 s	Secure	18.09.2017	