



**Verified Carbon
Standard**

BUNDLED SOLAR POWER PROJECT BY AMP ENERGY - 01



Document Prepared by (EKI Energy Services Limited)

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1 PROJECT DETAILS

1.1 Summary Description of the Project

The project involves installation of bundled Solar Photovoltaic (SPV) power plant with a cumulative capacity of 9.51 MW primarily to meet the captive demand of the premises owners and export of surplus power to grid through the mechanism of net metering. All the solar panel units involved in the project are implemented under DBFOT model, i.e., Design, Build, Finance, Operate and Transfer. The premises owners are the customers of the power generated from the solar panels who purchase the power under long term power purchase agreements signed for 25 years.

Before installation of the rooftop solar units, the Kochi Metro premises, Subros Ltd., SECI rooftop premises owners used to meet the electricity demand from the national grid of the India. The project thus replaces fossil fuel dominated grid electricity thereby reducing the equivalent amount of GHG emission.

There are three project activities included in the bundle to form a single project activity the details of which are furnished as below:

S.I No.	Project Company	Name of the project owner	Installation Location	Capacity (kW)	Date of commissioning
1	AMPSolar Power Generation Private Limited	Kochi Metro Rail Limited	Kochi Metro stations and depots	1900	06-May-2021
			Muttom Depot – ground mount	824.10	07-January-2022
			Muttom Depot – SBL Shed	928.20	31-March-2022
			Muttom Depot – Track A shed	556.92	31-March-2022
			Muttom Depot – Track B Shed	316.68	08-March-2022
			Road Area – Muttom Depot	655.2	29-August-2022
			Track B - Muttom Depot	10.92	29-August-2022
2		Subros Limited	Subros Limited (Research and development centre)	187.11	05-March-2021

S.I No.	Project Company	Name of the project owner	Installation Location	Capacity (kW)	Date of commissioning
3	AMP Energy Green (C&I) Private Limited	SECI Rooftop	Pondicherry University	2389.22	12-April-2021
			Mahatma Gandhi Post Graduate Institute of Dental Science (MGPGIDS)	199.66	29-September-2021
			Rajiv Gandhi Institute of Veterinary Education & Research (RIVER)	200	07-October-2021
			Indira Gandhi Medical College & Research Institute (IGMC&R)	348.4	20-October-2021
			Rajiv Gandhi Government Women & Children Hospital (RGGWCH)	190.21	20-October-2021
			Centre For Good Governance	290	15-September-2021
			Accounts General Audit	167.50	17-September-2021
			School of Planning & Architecture	119.93	19-September-2021
			MANIT	230	19-August-2021
Total				9514.97 kW (9.51 MW)	

The annual estimated emission reductions over 1st crediting period are 13,331 tCO₂e/annum.

The project is in operational phase in the same way as it has been described in the Joint PD MR report since the commissioning.

1.2 Sectoral Scope and Project Type

The project activity will have the following parameters:

Sectoral Scope: 01 - Energy industries (renewable / non-renewable sources)

Project Type: I - Renewable Energy Projects

Project Category: The project activity will apply only small-scale solar technology.

Methodology: AMS-I.F.: Renewable electricity generation for captive use and mini-grid – Version 5.0

1.3 Project Eligibility

The project activity involves installation and generation of electricity using renewable energy resources i.e., by using the solar energy (renewable sources) replacing electricity supply from a fossil-fuel dominated electricity, thus leads to reductions of anthropogenic GHG emissions from atmosphere. Hence the project activity is eligible Sectoral scope 1 i.e., energy industries (renewable/ non-renewable sources) under the scope of the VCS Program.

As the electricity produced by all the solar units involved in the proposed project is primarily intended to be used by the captive consumers and excess of the electricity to be supplied to the grid, 100% of the electricity generated by the solar PV units is to be accounted for emission reduction, even though the project is grid-connected, given that the main purpose is the delivery to the captive consumer.

The project intends to use the electricity generated from the solar PV units primarily for captive purpose and surplus (if any) is supplied to the grid as per the net metering mechanism. Therefore, the project is not a grid connected renewable energy project and does not fall in the excluded category as per the paragraph 2.1.1 of VCS Standard 4.3.

1.4 Project Design

The proposed project activity includes multiple locations but is not being developed as a grouped project.

1.5 Project Proponent

Organization name	AMPSolar Power Generation Private Limited
Contact person	Shriprakash Rai
Title	Director
Address	309, 3rd Floor, Rectangle One, Behind Sheraton Hotel, Saket, New Delhi, 110017 India
Telephone	8826022877
Email	markets@ampenergyindia.com

Organization name	AMP Energy Green (C&I) Private Limited
Contact person	Shriprakash Rai
Title	Director
Address	309, 3rd Floor, Rectangle One, Behind Sheraton Hotel, Saket, New Delhi, 110017 India
Telephone	8826022877
Email	markets@ampenergyindia.com

1.6 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the project	Project Consultant
Contact person	Ms. Neerja Agrawal
Title	Deputy Manager, Climate Change
Address	Office no. 201, Plot 48, Scheme 78 Part 2 Vijay Nagar, Near Brilliant Convention Centre Indore - 452010 (M.P, India) Website www.enkingint.org
Telephone	+91-8989880655
Email	neerja.agrawal@enking.org

Organization name	AMP Energy Markets India Private Limited
Role in the project	Authorized Representative
Contact person	Aditya Malpani
Title	Director
Address	309, 3rd Floor, Rectangle One, Behind Sheraton Hotel, Saket, New Delhi, 110017 India
Telephone	9867300018

Email

markets@ampenergyindia.com

1.7 Ownership

The renewable energy technology installed at site of each of the project activities as part of the proposed project activity are under ownership of respective SPV/Project Proponent. The Power Purchase Agreement (PPA) for the project activity and commissioning certificate for project activity are the supporting documents to demonstrate the project ownership.

This demonstrates the right of use according to clause 3.6.1 (3) of VCS Standard (v4.3) – “a project ownership arising by virtue of a statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions and/or removals”.

1.8 Project Start Date

Start date of project activity is 05-March-2021, which is the date of commissioning of the solar PV units involved in the project activity.

1.9 Project Crediting Period

Crediting Period Start date: 05-March-2021

Crediting Period End date: 04-March-2028

Since this is non- AFOLU project, the crediting period of the project activity shall be seven years, twice renewable for a total of 21 years.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Indicate the scale of the project (project or large project) and the estimated annual GHG emission reductions or removals for the project crediting period.

Project Scale	
Project	✓
Large project	

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 1	13,618
Year 2	13,522

Year 3	13,427
Year 4	13,331
Year 5	13,236
Year 6	13,140
Year 7	13,045
Total estimated ERs	93,319
Total number of crediting years	7
Average annual ERs	13,331

1.11 Description of the Project Activity

The project involves installation of bundled Solar Photovoltaic (SPV) power plant with a cumulative capacity of 9.51 MW primarily to meet the captive demand of the premises owners and export of surplus power to grid through the mechanism of net metering. All the solar panel units involved in the project are implemented under DBFOT model, i.e., Design, Build, Finance, Operate and Transfer. The premises owners are the customers of the power generated from the solar panels who purchase the power under long term power purchase agreements signed for 25 years.

Before installation of the rooftop solar units, the Kochi Metro premises, Subros Ltd., SECI rooftop premises owners used to meet the electricity demand from the national grid of the India. The project thus replaces fossil fuel dominated grid electricity thereby reducing the equivalent amount of GHG emission.

Net Metering:

Under the concept of Net Metering, the customers are charged only for the net power that they consume from the electricity service provider that has accumulated over a specific period. In other words, if their renewable energy generating systems make more electricity than consumed, they may be credited or paid for the excess electricity contributed to the grid over the same period. Net metering is also a way to increase the energy in the power grid to keep up with increase in demand during peak power use times, and this is of particular interest to states facing power shortages.

1.12 Project Location

The location of the bundled project activity is mentioned in the table below:

S.I No.	Name of the project owner	Installation Location	Premises Address	Capacity (kW)	Latitude (N)	Longitude (E)
1	Kochi Metro Rail Limited	Kochi Metro stations and depots	Kochi Metro stations and depots	1900	10° 0' 1.37" N	76° 17' 55.60" E
		Muttom Depot – ground mount	Alstom Transport India Limited KS1-Warehouse & Office, Near Kochi Metro Muttom Depot, Thaikkattukara PO, Aluva, Ernakulam-683106, Kerala 683106	824.10	10° 4' 37.76" N	76° 20' 21.34" E
		Muttom Depot – SBL Shed	Choornikkara, muttom, Aluva, Kerala 683106	928.20	10° 4' 47.06" N	76° 20' 37.84" E
		Muttom Depot – Track A shed		556.92	10° 4' 35.25" N	76° 20' 23.65" E
		Muttom Depot – Track B Shed		316.68	10° 4' 42.12" N	76° 20' 30.99" E
		Road Area		655.2	10° 4' 39.47" N	76° 20' 26.51" E
		Track B - Muttom Depot		10.92	10° 4' 42.12" N	76° 20' 30.99" E
2	Subros Limited	Subros Limited (Research and development centre)	C-51, Distt: Phase 2, Noida, Uttar Pradesh – 201305	187.11	28° 32' 23" N	77° 24' 52" E
3	SECI Rooftop	Pondicherry University	R Venkataraman Nagar, Kalapet, Puducherry-605014	2389.22	12° 1' 5.88" N	79° 51' 24.48" E

S.I No.	Name of the project owner	Installation Location	Premises Address	Capacity (kW)	Latitude (N)	Longitude (E)
		Mahatma Gandhi Post Graduate Institute of Dental Science (MGPGIDS)	Mahatma Gandhi Postgraduate Institute of Dental Sciences (MGPGI) Indra Nagar Gorimedu Pondicherry- 605006	199.66	11° 57' 27.144" N	79° 47' 35.88" E
		Rajiv Gandhi Institute of Veterinary Education & Research (RIVER)	Rajiv Gandhi Institute of Veterinary Education and Research (RIVER) Vazhudhavur Road, Kurumbapet, Puducherry – 605009	200	11° 56' 28.068" N	79° 45' 51.588" E
		Indira Gandhi Medical College & Research Institute (IGMC&R)	Indira Gandhi Medical College & Research Institute (IGMC) Vazhudhavur Road, Kathirkanam, Puducherry – 605009	348.4	11° 56' 25.584" N	79° 47' 46.68" E
		Rajiv Gandhi Government Women & Children Hospital (RGGWCH)	Rajiv Gandhi Government Women and Children Hospital (RGGWCH) Ellaipillaichavadi, Puducherry - 605009	190.21	11° 56' 48.804" N	79° 48' 56.736" E
		Centre For Good Governance	Survey No.91, Near Outer Ring Road, Chowrasta, Gachibowli, Hyderabad, Telangana – 500032	290	17° 26' 13.056" N	79° 21' 39.348" E
		Accounts General Audit	Ambedkar Colony, Khairtabad, Hyderabad, Telangana - 500004	167.50	17° 24' 19.548" N	79° 27' 46.609" E

S.I No.	Name of the project owner	Installation Location	Premises Address	Capacity (kW)	Latitude (N)	Longitude (E)
		School of Planning & Architecture	Survey No. 4/4, ITI Road, Vijaywada, Andhra Pradesh - 520008	119.93	16° 30' 22.1544" N	80° 39' 24.948" E
		MANIT	Link Road No.3, Near Mata Mandir, Bhopal, Madhya Pradesh - 462003	230	23° 13' 2.208" N	77° 24' 19.764" E

1.13 Conditions Prior to Project Initiation

The project is a Greenfield solar power project and does not involve generation of GHG emissions for the purpose of their subsequent reduction, removal or destruction. Prior to the initiation of the project activity, the equivalent amount of electricity would have been drawn from grid connected or new power plants, in Indian Grid. The grid is predominantly coal based and therefore is a major source of carbon dioxide emissions in India. The main emission in the pre project scenario is the power plants connected to the Indian Grid, and main GHG involved is CO₂. The baseline identified in section 3.4 is same as the pre-project scenario.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The Project has received necessary approvals for development and commissioning for each PV Plant from the state Nodal agencies and is in compliance to the local laws and regulations.

The relevant national laws and regulations pertaining to generation of energy in India are:

- Electricity Act 2003
- National Electricity Policy 2005
- Tariff Policy 2006

The Project activity conforms to all the applicable laws and regulations in India:

- Power generation using solar energy is not a legal requirement or a mandatory option.
- There are state and sectoral policies, framed primarily to encourage solar power projects. These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments.
- The Indian Electricity Act, 2003 (May 2007 Amendment) does not influence the choice of fuel used for power generation.
- There is no legal requirement on the choice of a particular technology for power generation.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The proposed project activity has not been registered and is not seeking registration at moment under any other GHG programs.

1.15.2 Projects Rejected by Other GHG Programs

The proposed project activity is not participating in other Environmental credits, other GHG programs and has not been rejected by other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The project activity under consideration is not participating in any other Emission trading programme and other binding limits.

The all-project activity is not participating at moment in any other emission trading programme and other binding limits. The GHG emission reductions generated during the current monitoring period have not been used for compliance of other mechanism.

1.16.2 Other Forms of Environmental Credit

The proposed 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.

1.17 Sustainable Development Contributions

1.17.1 Sustainable Development Contributions Activity Description

Contribution to sustainable development:

Apart from generation of renewable electricity, the project activity contributes to the sustainable development of the region - socially, environmentally and economically., 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 helped 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 promotes 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. The project activity creates local employment generation which helps economic well-being of local people.

- **Technological well-being:** The successful operation of project activity leads to promotion of solar based 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.

1.17.2 Sustainable Development Contributions Activity Monitoring

The project activity is solar renewable energy project to use electricity generated for captive purpose. The project activity thus reduces GHG emissions by displacing the fossil fuel dominated grid-based electricity with renewable electricity. The project activity provides direct and indirect employment opportunities for local persons towards installation, operation and maintenance of the proposed project activity. The project has resulted in increasing business opportunities for local contractors and suppliers during the various phases.

Project contributes towards following sustainable development goals achievement during the current monitoring period which are outlined below:

SDG - 7: Ensure access to affordable, reliable, sustainable and modern energy for all.

SDG - 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment, Equal pay and decent work for all and protect labour rights and promote safe working environment.

SDG - 13: Climate Action: Take urgent action to combat climate change and its impacts.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
<i>Sequential row number</i>	<i>SDG Target number</i>	<i>Number and text of SDG indicator or, if no official SDG indicator is applicable, user-defined indicator</i>	<i>Indicate the project's contribution to the SDG Indicator (implemented activities to increase or decrease)</i>	<i>Brief description of the quantifiable impact of the project's activities related to the SDG indicator, during the monitoring period.</i>	<i>Brief description of the cumulative quantifiable impact of the project's activities related to the SDG indicator, over the project lifetime.</i>
1)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	Activity: CO ₂ e Reduction The project has is estimated to reduce 13,331 tCO ₂ e annually during the crediting period.	The project has is estimated to reduce 13,331 tCO ₂ e annually during the crediting period.
2)	7.2	7.2.1: Renewable energy share in the total final energy consumption	Implemented activities to increase	Activity: Renewable electricity generation The project is estimated to generate 14,329 MWh of renewable energy annually during the crediting period.	The project is estimated to generate 14,329 MWh of renewable energy annually during the crediting period.

3)	8.5	8.5.2 Unemployment rate, by sex, age and persons with disabilities	Implemented activities to decrease	Activity: Employment The project has employed 10 workers. Thus, the project is contributing towards SDG 8.5.2 by increasing the employment opportunities to the local people.	The project has employed 10 workers. Thus, the project is contributing towards SDG 8.5.2 by increasing the employment opportunities to the local people.
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1.18 Additional Information Relevant to the Project

Leakage Management

Since the project activity is a renewable energy project based on solar technology, no leakage emissions are considered.

Thus, leakage management plan and implementation of leakage and risk mitigation measures are not applicable for this project activity.

Commercially Sensitive Information

Not applicable. No any commercially sensitive information has been excluded from the public version of the project description. There is no commercially sensitive information.

Further Information

Not Applicable

2 SAFEGUARDS

2.1 No Net Harm

The project activity promotes environmental and socio-economic well-being as it results in zero GHG emissions due to installation and operation of clean, renewable energy technology for electricity generation.

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 project activity operations do not result in direct air pollution, noise pollution. Please refer below web link for the same¹.

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.

2.2 Local Stakeholder Consultation

The local stakeholder consultation for the bundled project activities have been carried out. The stakeholders were identified and informed about the proposed project activity by circulating

¹ <http://mnre.gov.in/file-manager/UserFiles/report-on-developmental-impacts-of-RE.pdf>

pamphlets briefing the scope, nature and description of the project. The Local Stakeholder consultation documents will be provided during validation of project activity.

The local stakeholder consultations were carried out at the project sites:

Meeting No.	Local Stakeholder Meeting Date	Venue
1	26-April-2021	Kochi Metro Depots
2	26-February-2021	C-51, Distt: Phase 2, Noida, Uttar Pradesh – 201305
3	05-October-2021	Pondicherry University

AMP representative opened the meeting by welcoming everyone to the Stakeholder Consultation and explained the benefits of the Rooftop Solar System as presented below:

- Utilization of available vacant roof space
- Low gestation period
- Lower transmission and distribution losses
- Improvement in the tail-end grid voltages and reduction of system congestion
- Long term energy and ecological security by reduction in carbon emission
- Abatement of carbon over its life cycle

Alongside, AMP representative also provided an overview of the said rooftop project and the benefits during the consultation. It was observed that few of attendee already had good understanding of such type of project and how it is beneficial for the company and the environmental. After the detailed discussions, the session was open for questions from stakeholders.

The stakeholders were totally in support for setting up of these kinds of projects in their premises. There were no negative comments received from any of the stakeholders about the projects. All of them were content on implementation of such clean and green projects which are beneficial for the environment.

The Minutes of meeting along with the attendance sheet will be submitted to the DOE for further check. Regular stakeholder engagement is one the key focus at the project site. There is continuous monitoring and feedbacks received are addressed.

2.3 Environmental Impact

The guidelines on Environmental Impact Assessment have been published by Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India (GOI) under

Environmental Impact Assessment notification 14/09/2006². Further amendments to the notification have been done on 14/07/2018³. As per the notification:

The following projects or activities shall require prior environmental clearance from the concerned regulatory authority, which shall hereinafter referred to be as the Central Government in the Ministry of Environment, Forest and Climate Change matters falling under Category 'A' in the Schedule and at State level, the State Environment Impact Assessment Authority (SEIAA) for matters falling under Category 'B' in the said Schedule, before any construction work, or preparation of land by the project management except for securing the land, is started on the project or activity:

- (i) All new projects or activities listed in the Schedule to this notification;
- (ii) Expansion and modernization of existing projects or activities listed in the Schedule to this notification with addition of capacity beyond the limits specified for the concerned sector, that is, projects or activities which cross the threshold limits given in the Schedule, after expansion or modernization;
- (iii) Any change in product - mix in an existing manufacturing unit included in Schedule beyond the specified range.

As the solar power generation projects are not listed in any of the categories of the schedule. So, the project is considered environmentally safe and as per Host party- India no EIA is required.

2.4 Public Comments

This section can be addressed after the completion of the global stakeholder period.

2.5 AFOLU-Specific Safeguards

This section is not required as this project activity is a non - AFOLU project activity.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The project activity will be small scale project activity with power generation capacity less than or equal to 15 MW as per CDM terminology. Accordingly, below mentioned methodology will be used for each of the project activity.

² EIA Notification 2006: <http://envfor.nic.in/legis/eia/so1533.pdf>

³ EIA Notification 2018: <http://www.egcipl.com/Doc/Gazette%20Notification.pdf>

The methodology for the project activity will be the approved methodology for small- scale CDM project activities. The details of the methodology are as follows:

Methodology: AMS.I.F.

Project Type : Type-I: Renewable Energy Projects
 Title : Renewable Electricity Generation for captive use and Mini-grid
 Version No. : Version 05.0; EB 115
 Reference : CDM Methodologies⁴

Tools involved in the project are listed below:

1. Tool 07: Tool to calculate the emission factor for an electricity system - Version 7.0⁵
2. Tool 21: Demonstration of additionality of small-scale project activities – Version 13.1⁶
3. Tool 32: Methodological tool: Positive lists of technologies – Version 03.0⁷

3.2 Applicability of Methodology

The small-scale grid connected project activity will meet the applicability conditions of the approved methodology AMS I.F., Version 05.0, Sectoral Scope 1, as described below:

Applicability Condition of AMS I F Version 5.0	Project activity vis-à-vis applicability Conditions
This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s). The project activity will displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit i.e., in the absence of the project activity, the users would have been supplied electricity from one or more sources listed below: a. A national or a regional grid (grid hereafter); b. Fossil fuel fired captive power plant; c. A carbon intensive mini-grid.	The project intends to use the electricity generated from the solar rooftop and ground mounted units primarily for captive purpose and surplus (if any) is supplied to the grid as per the net metering mechanism. The solar plant units are located at the respective rooftop of the mentioned site at section 1. The project activity will displace electricity from INDAN Grid, which is supplied by predominantly fossil fuel plants. The project activity would replace equivalent quantum of fossil fuel dominated grid power that's being used prior to the project activity. Hence, the project activity justifies this applicability conditions.

⁴ (<https://cdm.unfccc.int/methodologies/DB/9KJWQ1G0WEG6LKHX21MLPS8BQR7242>)

⁵ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

⁶ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-21-v13.1.pdf>

⁷ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-32-v3.0.pdf>

Illustration of respective situations under which each of the methodology (AMS-I.D., AMS-I.F. and AMS-I.A.) applies is included in Table.	The project activity applies methodology AMS I.F and the detailed scenario has been explained after end of this table.
Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: a. The project activity is implemented in an existing reservoir with no change in the volume of reservoir; b. The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in project emissions section is greater than 4 W/m² c. The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m².	Project activity does not include hydro power generation.
This methodology is applicable for project activities that: a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); b) Involve a capacity addition, c) Involve a retrofit of (an) existing plant(s); or d) Involve a replacement of (an) existing plant(s).	The project activity is installation of greenfield power plants. Hence the condition (a) is justified by the project activity.
In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	Project activity is not a capacity addition. All are greenfield installation.
In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	This Project activity is not a retrofit or replacement of existing project activity

If the unit added has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The project activity does not have a non-renewable component.
Combined heat and power (co-generation) systems are not eligible under this category.	The project activity does not involve with co-generation.
If electricity and/or steam/heat produced by the project activity is delivered to a third party, i.e., another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered that ensures that there is no double counting of emission reductions.	The project activity has a contractual agreement between supplier and consumers in order to specifically avoid double counting.
In the case the project activities utilize biomass, the "TOOL16: Project and leakage emissions from biomass" shall be applied to determine the relevant project emissions from the cultivation of biomass and the utilization of biomass or biomass residues.	The project activity does not involve with biomass usage.

Differentiation amongst applicability of AMS – I.A, AMS-I.D and AMS- I.F

	Project type	AMS-I.A	AMS-I.D	AMS-I.F
1	Project supplies electricity to a national/regional grid		√	
2	Project displaces grid electricity consumption (e.g., grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			√
3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√	
4	Project supplies electricity to a mini grid ⁷ system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			√
5	Project supplies electricity to household users (included in the project boundary) located in off grid areas	√		

As the rooftop and ground mounted solar units involved in the proposed project generate electricity primarily to deliver to captive consumers and excess electricity is to be supplied to the grid, this resembles the scenario listed at S.I no. 2 of the above table and hence the methodology, AMS I.F. is applied appropriately.

The solar units involved in the project are installed for the primary purpose of meeting captive electricity demand of the premises owners. The rooftop solar units are connected to the national grid through net metering mechanism, an arrangement which allows any surplus electricity produced to be fed to grid. Actual electricity consumption of the institutes is very high when compared with the units generated from the solar units. Being implemented with the primary purpose of meeting captive electricity demand, the project is eligible in line with para 2.1.1 of the VCS Standard Version 4.3

Tool 07: Tool to calculate the emission factor for an electricity system⁸ - Version 07.0 (EB 100, Annex 04)

Applicability Criterion	Project Case
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g., demand-side energy efficiency projects).	The project is a grid connected Greenfield solar power project and thus the tool is applicable.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e., option II a and option IIb. If option II a is chosen, the conditions specified in “Appendix 2: Procedures related to off-grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Steps involved in calculation of Emission Factor is included in section 4.1 of the PD as per the requirement of the tool.
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	Project activity is located in non-Annex I country and hence the tool is applicable

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

Under this tool, the value applied to the CO ₂ emission factor of biofuels is zero.	The project activity is a solar project and there is no involvement of biofuels.
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The project activity qualifies as Type I during every year of the crediting period in accordance with applicable provisions for project activity eligibility as discussed above. Also, the cumulative capacity of the project activity is 9.51 MW consisting of small-scale project activity and respective methodology will be applicable for the project activity.

3.3 Project Boundary

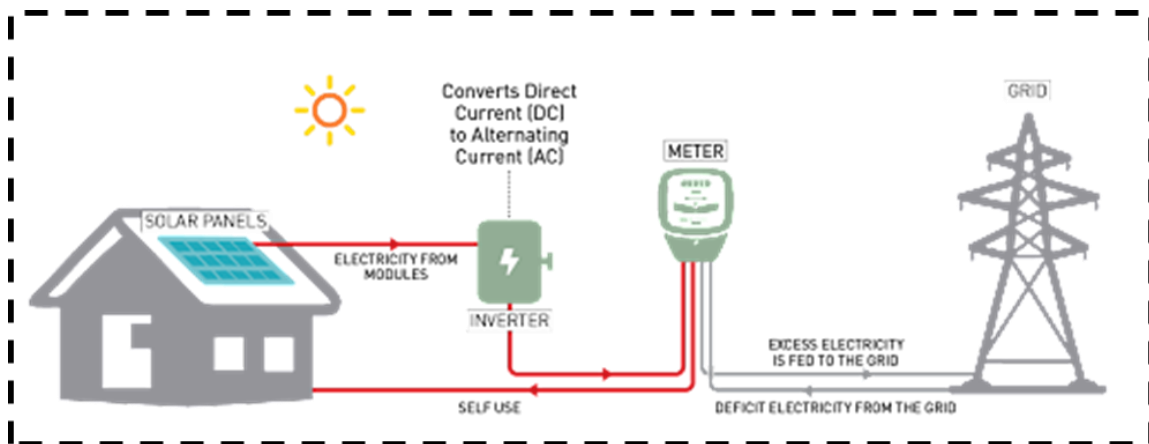
As per AMS I.F, Version 5.0 “The spatial extent of the project boundary includes industrial, commercial facilities consuming energy generated by the system. In the case of electricity generated and supplied to distributed users (e.g., residential users) via mini/isolated grid(s) the project boundary may be confined to physical, geographical site of renewable generating units. The boundary also extends to the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.”

The project boundary includes the solar rooftop project installed at the user’s roof. Users might also be connected to the Indian grid. Therefore, the entire Indian grid and all connected power plants have been considered in the project boundary for the proposed VCS project activity.

The table below provides an overview of the emissions sources included or excluded from the project boundary for determination of baseline and project emissions.

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

The grid will come under the project boundary as the solar rooftop units are connected to the grid through net metering mechanism. The pictorial depiction of the project boundary is given below.



3.4 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 per AMS I.F Version 05.0; “For project activities that displace electricity consumed from the electric grid and from a fossil fuel fired on-site captive power plant , the baseline emission factor shall reflect the emissions intensity of the grid and the captive power plant in the baseline scenario i.e., the weighted average emission factor for the displaced electricity is calculated using values based on the historical (prior three year ratio) of electricity from captive plants and the grid. For new facilities, the most conservative (lowest) of the emission factor for the two power sources should be used.

Hence, the baseline for the project activity is the equivalent amount of power from the Indian grid. The combined margin ($EF_{CO_2, y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) (having weightage 75%) and build margin (BM) (having weightage 25%). Calculations for this combined margin must be based on data from an official source of CEA database (where available) and made publicly available.

The combined margin of the INDIAN National Grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
$EF_{grid, CM, y}$	0.9305 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 17.0 October - 21 published by Central Electricity Authority (CEA), Government of India

EF _{grid,OM,y}	0.9522 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3-year (2018-19, 2019-20, 2020-21) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 17.0 October - 21 published by Central Electricity Authority (CEA), Government of India
EF _{grid,BM,y}	0.8653 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	Baseline CO ₂ Emission Database, Version 17.0, October - 21 published by Central Electricity Authority (CEA), Government of India

3.5 Additionality

The additionality of a project shall be demonstrated by applying the following approach, consisting of two components:

- (i) A Legal Requirement Test; and
- (ii) An Additionality Test either based on a positive List test or a projects-specific additionality test.

(a) Legal Requirement Test

The project is not enforced by law. The project passes the legal requirement test since there are no enforced laws, statutes, regulations, court orders, environmental-mitigation agreements, permitting conditions of other legally-binding mandates requiring its implementation. Since voluntary commitments/agreements within a sector or by an entity do not constitute the legal requirement, the outcome of the legal requirement test is concluded as positive.

(b) Additionality Test

In accordance with applied Tool 21, “Demonstration of additionality of small-scale project activities” Version 13.1, the project proponent shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

- Investment barrier
- Technological barrier
- Barrier due to prevailing practice
- Other barriers

The project proponents have identified “investment barrier” as the most relevant barrier faced by the project activity. The investment barrier faced by the project activity consists of barrier due to high capital cost and consequent impact on return.

Investment Barrier:

The purpose of investment analysis is to determine whether the project activity is economically or financially less attractive than other alternatives without additional funding that may be derived from the sale of carbon credits. The investment analysis was conducted in accordance with guidelines on investment analysis.

The project proponent has considered Equity IRR as the suitable financial indicator for investment analysis.

Suitability of Benchmark:

As per Tool 27: Investment analysis, Version 11.0, EB 112, Annex 2 “In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for an equity IRR. Benchmarks supplied by relevant national authorities are also appropriate if the DOE can validate that they are applicable to the project activity and the type of IRR calculation presented.”

Accordingly, the project proponent has selected required/ expected returns on equity as the appropriate benchmark for the project.

The investment analysis has been carried out in Nominal terms. Accordingly, Default value has been adjusted by adding suitable forecasted inflation rate taken from RBI (Central Bank, India). Project proponent has calculated Benchmark based on WPI mean inflation rate. As per paragraph 16 of the Tool 27: Investment analysis, Version 11.0, EB 112, Annex 2, the inflation forecast should be for the duration of the crediting period. However, since RBI provides forecast inflation only for 5 & 10 years, the project investor has calculated benchmark using 10 years durations and the same is considered as Benchmark for the project activity.

Methodology deployed for arriving at a suitable value of Benchmark using Default Value has been described below:

For Kochi Metro Rail Limited (5.19 MW):

- As the proposed project activity generates power utilizing solar energy, Group 1 as per paragraph 5 of Appendix of EB 112, Annex 2 has been identified as a suitable category.
- The investment analysis has been carried out in Nominal terms. Accordingly, default value as given in paragraph 6, Appendix, Annex 2, EB 112 has been adjusted by adding suitable forecasted inflation rate taken from RBI (Central Bank, India).
- Project proponent has calculated Benchmark based on WPI mean inflation rate. As per paragraph 16 of Appendix of EB 112, Annex 2, the inflation forecast should be for the duration of the crediting period. The project investor has calculated benchmark using 10 years inflation as Benchmark for the project activity.

The benchmark has been computed in the following manner:

$$\text{Nominal Benchmark}^9 = \{(1 + \text{Real Benchmark}) * (1 + \text{Inflation rate})\} - 1$$

⁹ As per Fisher Equation, https://en.wikipedia.org/wiki/Fisher_equation

where,

Real Benchmark = Default Value, i.e., 10.24% (as per Tool 27: Investment Analysis, version 10.0¹⁰, available at the time of investment decision)

Inflation rate = Projected Inflation Rate for India, i.e., 4.50¹¹

The latest Results of the Survey of Professional Forecasters on Macroeconomic Indicators – Round 51 published by Reserve Bank of India on 05-April-2018 has been referred for the projected inflation rate of India.

The nominal benchmark has been calculated as $= \{(1+10.24) * (1+4.50)\} - 1 = 15.20\%$

The Post tax Equity IRR is evaluated for the entire lifetime of the project activity, i.e., 25 years.

It is calculated based on the cash outflows from and cash inflows into the project activity. The IRR and Benchmark analysis are calculated in excel spreadsheet and same will be submitted to the DoE during verification of project activity. Based on result of IRR excel spreadsheets, equity IRR is less than Benchmark. This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark). Thus, it can be easily concluded that project activity is additional & is not business as usual scenario. Input values used in all investment analysis shall be valid and applicable at the time of the investment decision taken by the project proponent which can be clearly verified; thus, it complies with guidance 10 of EB 112, Annex 2.

The financial spread sheets for the key assumption (source of parameters) supporting the financial projections are tabulated below:

Parameters	Values	Source
Details of the project		
Project Location	Kerala	DPR/ Commissioning certificate
Total Capacity (MW)	5.192	Commissioning certificates
Expected Date of Commissioning	06-May-2021	DPR
Life of the plant (Yrs.)	25	DPR
Generation of electricity		
PLF (%)	17.37%	DPR
Annual generation (kWh)	79,02,224	Calculated Value
Annual Degradation per year from 2nd year onwards	0.70%	DPR
Tariff rate at the decision making (INR/kWh)	4.55	PPA
Operation and maintenance cost and Insurance		
O & M Expenses (INR Mn.)	1.76	DPR
O & M free for (Yr.)	-	DPR

¹⁰ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v10.0.pdf>

¹¹ <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=18113>

Escalation in the operational expenses (%)	2.00%	DPR
Management Fee	1.23	DPR
Escalation (%)	0.00%	
Admin Fee (₹ Mn)	0.50	DPR
Escalation (%)	5.00%	DPR
Salary (₹ Mn)	0.30	DPR
Escalation (%)	5.00%	DPR
Lender's maintenance (₹ Mn)	0.20	DPR
Escalation (%)	0.00%	DPR
Insurance (₹ Mn)	0.39	DPR
Escalation (%)	0.00%	DPR
DSM - Penalty (~1% of revenue) (₹ Mn)	0.00	DPR
Financial parameters		
TOTAL COST (INR Mn.)	309.00	DPR
Loan Amount (INR Mn.)	216.00	DPR
Equity Investment (INR Mn.)	92.70	Calculated Amount
Term loan		
Loan Amount (INR Mn.)	216.30	70:30 ratio as per DPR
Interest rate (%)	10.15%	DPR
Loan Tenure (Qtr.)	64.00	DPR
Moratorium Period (Qtr.)	4.00	
Repayment Period (Qtr.)	60.00	Calculated Value
Repayment instalments value (INR Mn.)	3.61	Calculated Value
1st instalment from (Qtr. end)	30-Jun-22	Considered from the next Quarter End
Book Depreciation (SLM Method)		
Gross Depreciable Value (INR Mn.)	309.00	Calculated
Salvage Value (%)	5.00%	DPR
Salvage value (INR Mn.)	15.45	Calculated
Net Depreciable Value (INR Mn.)	293.55	Calculated
Residual Value (INR Mn.)	15.45	Calculated
IT Depreciation		
IT Depreciation (%)	40.00%	As per IT Act
Income Tax		
Financial Year	FY 2018-19	
Income tax rate (%)	25.00%	As Per Income Tax Rule
Corporate Tax / MAT (%)	0.00%	As Per IT rule
GST (%)	18.00%	As Per Income Tax Rule
Surcharge (%)	7.00%	As Per Income Tax Rule

Health & Education cess (%)	4.00%	As Per Income Tax Rule
Final Tax rates		
Income tax rate (%)	27.82%	Calculated Value
MAT (%)	0.00%	Calculated Value
GST (%)	18.00%	Calculated Value

Considering the input values, Equity IRRs is given below:

Equity IRR	9.39%
Benchmark	15.20%

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

Sub-step 2d: Sensitivity Analysis

Addressing section 7 of EB 112, Annex 2, following factors has been subjected to sensitivity analysis:

1. PLF
2. O&M Cost
3. Project Cost
4. Tariff Rate

The rationale of sensitivity is, "The ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis."

Variation %	-10%	Base	10%	Breaching value
PLF	6.04%	9.39%	13.07%	15.44%
O&M	9.89%	9.39%	8.88%	-114.10%
Project Cost	13.78%	9.39%	6.37%	-12.51%
Tariff Rate	6.04%	9.39%	13.07%	15.44%

This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark Equity IRR) for any of the investor. Thus, it can be easily concluded that project activity is additional and is not business as usual scenario.

For Subros Limited (0.187 MW):

- As the proposed project activity generates power utilizing solar energy, Group 1 as per paragraph 5 of Appendix of EB 112, Annex 2 has been identified as a suitable category.
- The investment analysis has been carried out in Nominal terms. Accordingly, default value

as given in paragraph 6, Appendix, Annex 2, EB 112 has been adjusted by adding suitable forecasted inflation rate taken from RBI (Central Bank, India).

- Project proponent has calculated Benchmark based on WPI mean inflation rate. As per paragraph 16 of Appendix of EB 112, Annex 2, the inflation forecast should be for the duration of the crediting period. The project investor has calculated benchmark using 10 years inflation as Benchmark for the project activity.

The benchmark has been computed in the following manner:

$$\text{Nominal Benchmark}^{12} = \{(1 + \text{Real Benchmark}) * (1 + \text{Inflation rate})\} - 1$$

where,

Real Benchmark = Default Value, i.e., 10.24% (as per Tool 27: Investment Analysis, version 10.0¹³, available at the time of investment decision)

Inflation rate = Projected Inflation Rate for India, i.e., 4.50¹⁴

The latest Results of the Survey of Professional Forecasters on Macroeconomic Indicators – Round 51 published by Reserve Bank of India on 05-April-2018 has been referred for the projected inflation rate of India.

The nominal benchmark has been calculated as = $\{(1 + 10.24) * (1 + 4.50)\} - 1 = 15.20\%$

The Post tax Equity IRR is evaluated for the entire lifetime of the project activity, i.e., 25 years.

It is calculated based on the cash outflows from and cash inflows into the project activity. The IRR and Benchmark analysis are calculated in excel spreadsheet and same will be submitted to the DoE during verification of project activity. Based on result of IRR excel spreadsheets, equity IRR is less than Benchmark. This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark). Thus, it can be easily concluded that project activity is additional & is not business as usual scenario. Input values used in all investment analysis shall be valid and applicable at the time of the investment decision taken by the project proponent which can be clearly verified; thus, it complies with guidance 10 of EB 112, Annex 2.

The financial spread sheets for the key assumption (source of parameters) supporting the financial projections are tabulated below:

Parameters	Values	Source
Details of the project		
Project Location	Uttar Pradesh	DPR/ Commissioning certificate
Total Capacity (MW)	0.187	Commissioning certificates
Expected Date of Commissioning	05-March-2021	DPR

¹² As per Fisher Equation, https://en.wikipedia.org/wiki/Fisher_equation

¹³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v10.0.pdf>

¹⁴ <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=18113>

Life of the plant (Yrs.)	25	DPR
Generation of electricity		
PLF (%)	16.97%	DPR
Annual generation (kWh)	2,78,069	Calculated Value
Annual Degradation per year from 2nd year onwards	0.70%	DPR
Tariff rate at the decision making (INR/kWh)	4.00	PPA
Subsidy Receipt (year)		
2023	66%	
2024	17%	
2025	17%	
Operation and maintenance cost and Insurance		
O & M Expenses (INR Mn.)	0.06	DPR
O & M free for (Yr.)	-	DPR
Escalation in the operational expenses (%)	2.00%	DPR
Management Fee	0.04	DPR
Escalation (%)	0.00%	
Admin Fee (₹ Mn)	0.02	DPR
Escalation (%)	5.72%	DPR
Salary (₹ Mn)	0.01	DPR
Escalation (%)	5.72%	DPR
Lender's maintenance (₹ Mn)	0.10	DPR
Escalation (%)	5.72%	DPR
Insurance (₹ Mn)	0.01	DPR
Escalation (%)	0.00%	DPR
Financial parameters		
TOTAL COST (INR Mn.)	6.14	DPR
Loan Amount (INR Mn.)	4.30	DPR
Equity Investment (INR Mn.)	1.84	Calculated Amount
Term loan		
Loan Amount (INR Mn.)	4.30	70:30 ratio as per DPR
Interest rate (%)	9.75%	DPR
Loan Tenure (Qtr.)	52	DPR
Moratorium Period (Qtr.)	4	
Repayment Period (Qtr.)	48	Calculated Value
Repayment instalments value (INR Mn.)	0.090	Calculated Value
1st instalment from (Qtr. end)	31-March-22	Considered from the next Quarter End
Book Depreciation (SLM Method)		
Gross Depreciable Value (INR Mn.)	6.14	Calculated

Salvage Value (%)	5.00%	DPR
Salvage value (INR Mn.)	0.31	Calculated
Net Depreciable Value (INR Mn.)	5.83	Calculated
Residual Value (INR Mn.)	0.31	Calculated
IT Depreciation		
IT Depreciation (%)	40.00%	As per IT Act
Income Tax		
Financial Year	FY 2021-22	
Income tax rate (%)	25.00%	As Per Income Tax Rule
Corporate Tax / MAT (%)	0.00%	As Per IT rule
GST (%)	18.00%	As Per Income Tax Rule
Surcharge (%)	7.00%	As Per Income Tax Rule
Health & Education cess (%)	4.00%	As Per Income Tax Rule
Final Tax rates		
Income tax rate (%)	27.82%	Calculated Value
MAT (%)	0.00%	Calculated Value
GST (%)	18.00%	Calculated Value

Considering the input values, Equity IRRs is given below:

Equity IRR	10.67%
Benchmark	15.20%

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

Sub-step 2d: Sensitivity Analysis

Addressing section 7 of EB 112, Annex 2, following factors has been subjected to sensitivity analysis:

5. PLF
6. O&M Cost
7. Project Cost
8. Tariff Rate

The rationale of sensitivity is, "The ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis."

Variation %	-10%	Base	10%	Breaching value
PLF	6.12%	10.67%	15.59%	9.23%
O&M	11.46%	10.67%	9.88%	-57.48%

Project Cost	14.48%	10.67%	7.87%	-11.56%
Tariff Rate	6.12%	10.67%	15.59%	9.23%

This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark Equity IRR) for any of the investor. Thus, it can be easily concluded that project activity is additional and is not business as usual scenario.

For SECI Rooftop (4.13 MW):

- As the proposed project activity generates power utilizing solar energy, Group 1 as per paragraph 5 of Appendix of EB 112, Annex 2 has been identified as a suitable category.
- The investment analysis has been carried out in Nominal terms. Accordingly, default value as given in paragraph 6, Appendix, Annex 2, EB 112 has been adjusted by adding suitable forecasted inflation rate taken from RBI (Central Bank, India).
- Project proponent has calculated Benchmark based on WPI mean inflation rate. As per paragraph 16 of Appendix of EB 112, Annex 2, the inflation forecast should be for the duration of the crediting period. The project investor has calculated benchmark using 10 years inflation as Benchmark for the project activity.

The benchmark has been computed in the following manner:

$$\text{Nominal Benchmark}^{15} = \{(1 + \text{Real Benchmark}) * (1 + \text{Inflation rate})\} - 1$$

where,

Real Benchmark = Default Value, i.e., 10.24% (as per Tool 27: Investment Analysis, version 10.0¹⁶, available at the time of investment decision)

Inflation rate = Projected Inflation Rate for India, i.e., 4.50¹⁷

The latest Results of the Survey of Professional Forecasters on Macroeconomic Indicators – Round 51 published by Reserve Bank of India on 05-April-2018 has been referred for the projected inflation rate of India.

The nominal benchmark has been calculated as = $\{(1 + 10.24) * (1 + 4.50)\} - 1 = 15.20\%$

The Post tax Equity IRR is evaluated for the entire lifetime of the project activity, i.e., 25 years.

It is calculated based on the cash outflows from and cash inflows into the project activity. The IRR and Benchmark analysis are calculated in excel spreadsheet and same will be submitted to the DoE during verification of project activity. Based on result of IRR excel spreadsheets, equity IRR is less than Benchmark. This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark). Thus, it can be easily concluded that project activity is additional & is not business as usual scenario. Input values used in all investment analysis shall be valid and applicable at the time of the investment decision taken

¹⁵ As per Fisher Equation, https://en.wikipedia.org/wiki/Fisher_equation

¹⁶ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v10.0.pdf>

¹⁷ <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=18113>

by the project proponent which can be clearly verified; thus, it complies with guidance 10 of EB 112, Annex 2.

The financial spread sheets for the key assumption (source of parameters) supporting the financial projections are tabulated below:

Parameters	Values	Source
Details of the project		
Project Location	Pondicherry, Telangana, Madhya Pradesh	Commissioning certificates
Total Capacity (MW)	4.13	Commissioning certificates
Expected Date of Commissioning	12-April-2021	DPR
Life of the plant (Yrs.)	25	DPR
Generation of electricity		
PLF (%)	17.85%	DPR
Annual generation (kWh)	64,59,320	Calculated Value
Annual Degradation per year from 2nd year onwards	0.70%	DPR
Tariff rate at the decision making (INR/kWh)	3.30	PPA
Subsidy Receipt (year)		
2023	100%	
2024	0%	
2025	0%	
Operation and maintenance cost and Insurance		
O & M Expenses (INR Mn.)	1.40	DPR
O & M free for (Yr.)	-	DPR
Escalation in the operational expenses (%)	5.72%	DPR
Management Fee	0.49	DPR
Escalation (%)	0.00%	
Admin Fee (₹ Mn)	0.50	DPR
Escalation (%)	5.72%	DPR
Salary (₹ Mn)	0.70	DPR
Escalation (%)	5.72%	DPR
Lender's maintenance (₹ Mn)	0.50	DPR
Escalation (%)	5.72%	DPR
Insurance (₹ Mn)	0.31	DPR
Escalation (%)	0.00%	DPR
Financial parameters		
TOTAL COST (INR Mn.)	162.78	DPR
Loan Amount (INR Mn.)	97.67	DPR
Equity Investment (INR Mn.)	65.11	Calculated Amount
Term loan		

Loan Amount (INR Mn.)	97.67	60:40 ratio as per DPR
Interest rate (%)	10.20%	DPR
Loan Tenure (Qtr.)	68	DPR
Moratorium Period (Qtr.)	-	
Repayment Period (Qtr.)	68	Calculated Value
Repayment instalments value (INR Mn.)	1.436	Calculated Value
1st instalment from (Qtr. end)	30-September-21	Considered from the next Quarter End
Book Depreciation (SLM Method)		
Gross Depreciable Value (INR Mn.)	162.78	Calculated
Salvage Value (%)	5.00%	DPR
Salvage value (INR Mn.)	8.14	Calculated
Net Depreciable Value (INR Mn.)	154.64	Calculated
Residual Value (INR Mn.)	8.14	Calculated
IT Depreciation		
IT Depreciation (%)	40.00%	As per IT Act
Income Tax		
Financial Year	FY 2021-22	
Income tax rate (%)	25.00%	As Per Income Tax Rule
Corporate Tax / MAT (%)	0.00%	As Per IT rule
GST (%)	18.00%	As Per Income Tax Rule
Surcharge (%)	7.00%	As Per Income Tax Rule
Health & Education cess (%)	4.00%	As Per Income Tax Rule
Final Tax rates		
Income tax rate (%)	27.82%	Calculated Value
MAT (%)	0.00%	Calculated Value
GST (%)	18.00%	Calculated Value

Considering the input values, Equity IRRs is given below:

Equity IRR	9.68%
Benchmark	15.20%

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

Sub-step 2d: Sensitivity Analysis

Addressing section 7 of EB 112, Annex 2, following factors has been subjected to sensitivity analysis:

9. PLF
10. O&M Cost
11. Project Cost
12. Tariff Rate

The rationale of sensitivity is, "The ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis."

Variation %	-10%	Base	10%	Breaching value
PLF	4.71%	9.68%	14.31%	11.98%
O&M	10.83%	9.68%	8.44%	-54.40%
Project Cost	14.85%	9.68%	5.93%	-10.58%
Tariff Rate	4.71%	9.68%	14.31%	11.98%

This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark Equity IRR) for any of the investor. Thus, it can be easily concluded that project activity is additional and is not business as usual scenario.

3.6 Methodology Deviations

Not Applicable

4 ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

For Solar grid connected rooftop systems:

As per paragraph 20 of AMS-I.F. version 05.0, the baseline emissions for other systems are the product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor.

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

where,

BE_y = Baseline emissions in year y (tCO₂/yr)

$EG_{BL, y}$ = 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)

$EF_{CO_2, y}$ = Emission factor (tCO₂/MWh)

Emission factor of a grid shall be calculated as per the procedures provided in AMS-I.F:

As per methodology, combined grid emission factor as per the “Tool 07: Tool to calculate the emission factor for an electricity system” version 07 is calculated as below.

CO₂ Baseline Database for the Indian Power Sector, Version 17, October 2021¹⁸ published by Central Electricity Authority (CEA), Government of India has been used for the calculation of emission reduction.

As per Methodological tool: Tool 07 - Tool to calculate the emission factor for an electricity system (Version 7.0, EB 100, Annex 4), following six steps have been followed:

- a) **Step 1:** Identify the relevant electricity systems;
- b) **Step 2:** Choose whether to include off-grid power plants in the project electricity system (optional);
- c) **Step 3:** Select a method to determine the operating margin (OM);
- d) **Step 4:** Calculate the operating margin emission factor according to the selected method;
- e) **Step 5:** Calculate the build margin (BM) emission factor;
- f) **Step 6:** Calculate the combined margin (CM) emission factor.

Step 1: Identify the relevant electricity systems

As described in tool “For determining the electricity emission factors, identify the relevant project electricity system. Similarly, identify any connected electricity systems”. It also states that “If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used”. Keeping this into consideration, the Central Electricity Authority (CEA), Government of India have Indian grid.

However, since August 2006, however, all regional grids except the Southern Grid had been integrated and were operating in synchronous mode, i.e. at same frequency. Consequently, the Northern, Eastern, Western and North-Eastern grids were treated as a single grid named as NEWNE grid from FY 2007-08 onwards for the purpose of this CO₂ Baseline Database. As of 31 December 2013, the Southern grid has also been synchronized with the NEWNE grid, hence forming one unified Indian Grid. Since the project supplies electricity to the Indian grid, emissions generated due to the electricity generated by the Indian grid as per CM calculations will serve as the baseline for this project.

Table: Geographical Scope of Indian Electricity Grid

¹⁸ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

Northern	Eastern	Western	North-Eastern	Southern
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Andhra Pradesh
Delhi	Jharkhand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	West Bengal	Dadar & Nagar Haveli	Meghalaya	Tamil Nadu
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Telangana
Punjab	Andaman & Nicobar	Maharashtra	Nagaland	Puducherry
Rajasthan		Goa	Tripura	Lakshadweep
Uttar Pradesh				
Uttarakhand				

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

The project proponent may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included in the calculation.

The project proponent has chosen only grid power plants in the calculation.

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

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods, which are described under Step 4:

- (a) Simple OM; or
- (b) Simple adjusted OM; or
- (c) Dispatch data analysis OM; or
- (d) Average OM.

The data required to calculate Simple adjusted OM and Dispatch data analysis OM is not possible due to lack of availability of data to project developers. The choice of other two options for calculating operating margin emission factor depends on generation of electricity from low-cost/must-run sources. In the context of the methodology low cost/must run resources typically include hydro, geothermal, solar, low-cost biomass, nuclear and solar generation.

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
India	15.1%	14.6%	14.3%	14.5%	17.0%	16.5%

Data Source: Central Electricity Authority (CEA) database Version 17, October 2021¹⁹

The above data clearly shows that the percentage of total grid generation by low-cost/ must-run plants (on the basis of average of five most recent years) for the Indian grid is less than 50 % of the total generation. Thus, the Average OM method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation.

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

For the simple OM, the simple adjusted OM and the average OM, the emissions factor can be calculated using either of the two following data vintages:

(a) **Ex-ante option:** if the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required.

OR

(b) **Ex-post option:** if the ex-post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

Project Proponent has chosen ex-ante option for calculation of Simple OM emission factor using a 3-year generation-weighted average, based on the most recent data available at the time of submission of the PD to the DOE for validation.

OM determined at validation stage will be the same throughout the crediting period. There will be no requirement to monitor and recalculate the emission factor during the crediting period.

Step 4: Calculate the operating margin emission factor ($EF_{grid, OMSimple, y}$) according to the selected method

The operating margin emission factor has been calculated using a 3-year data vintage:

Net Generation in Operating Margin (GWh) (incl. Imports)				
	2017-18	2018-19	2019-20	2020-21
INDIAN Grid	9,60,639	9,95,957	965,009	9,58,218

¹⁹ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

Simple Operating Margin (tCO ₂ /MWh) (incl. Imports)				
	2017-18	2018-19	2019-20	2020-21
INDIAN Grid	0.9543	0.9603	0.9555	0.9405

Weighted Generation Operating Margin	
INDIAN Grid	0.9522

Step 5: Calculate the build margin (BM) emission factor ($EF_{grid, BM, y}$)

As per Methodological tool: “Tool 07: Tool to calculate the emission factor for an electricity system” (Version 7.0, EB 100, Annex 4) para 72:

In terms of vintage of data, the project proponent can choose between one of the following two options:

(a) **Option 1** - For the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of PD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

(b) **Option 2** - For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

Option 1 as described above is chosen by Project proponent to calculate the build margin emission factor for the project activity. BM is calculated ex-ante based on the most recent information available at the time of submission of PD and is fixed for the entire crediting period.

Build Margin (tCO ₂ /MWh) (not adjusted for imports)	
	2020-21
INDIAN Grid	0.8653

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

As per Methodological tool: “Tool 07: Tool to calculate the emission factor for an electricity system” (Version 7.0, EB 100, Annex 4) para 81:

The calculation of the combined margin (CM) emission factor ($EF_{grid, CM, y}$) is based on one of the following methods:

(a) Weighted average CM; or

(b) Simplified CM.

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

The combined margin emissions factor is calculated as follows:

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

where:

$EF_{grid, BM, y}$ = Build margin CO₂ emission factor in year y (tCO₂e/MWh)

$EF_{grid, OM, y}$ = Operating margin CO₂ emission factor in year y (tCO₂e/MWh)

W_{OM} = Weighting of operating margin emissions factor (%)

W_{BM} = Weighting of build margin emissions factor (%)

The following default values should be used for W_{OM} and W_{BM} :

For solar project activities: $W_{OM} = 0.75$ and $W_{BM} = 0.25$ (owing to their intermittent and non-dispatchable nature) for the second crediting period and for subsequent crediting periods. Since project activity is of power generation by using solar, the above weightage has been considered for OM and BM.

$$\begin{aligned} \text{Therefore, } EF_{grid, CM, y} &= 0.8653 * 0.25 + 0.9522 * 0.75 \\ &= 0.9305 \text{ tCO}_2\text{e/MWh} \end{aligned}$$

Therefore, referring to the applied methodology AMS.I.F. Version 5.0, the $EF_{CO_2, y}$ for grid connected and mini grid project instances would be $EF_{grid, CM, y}$ i.e., 0.9305 tCO₂e/MWh. The baseline emission factor is ex- ante parameter and will remain constant throughout the crediting period.

$$BE_y = 13,618 * 0.9305 = 13,618 \text{ tCO}_2\text{e (estimated value for first year of operation)}$$

4.2 Project Emissions

As per the approved consolidated Methodology AMS.I.F. Version 5.0 “For most renewable energy power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

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

Where:

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

$PE_{FF, y}$ = Project emissions from fossil fuel consumption in year y (tCO₂e/yr)

$PE_{GP, y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (tCO₂e/yr)

$PE_{HP, y}$ = Project emissions from water reservoirs of hydro power plants in year y (tCO₂e/yr)

As the project activity is the installation of a new grid-connected solar power plant 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 $PE_{FF, y}$, $PE_{GP, y}$, $PE_{HP, y}$ is equal to zero and thus, $PE_y = 0$.

4.3 Leakage

Since the project activity is a renewable energy project based on solar PV technology, no leakage emissions are considered - in line with paragraph 29 of the small-scale methodology AMS.I.F. (version 5.0).

4.4 Estimated Net GHG Emission Reductions and Removals

As per the paragraph 30 of AMS-I.F. version 5.0, the formula to calculate the emission reduction is:

$$ER_y = BE_y - PE_y - LE_y$$

As the project activity is a solar project, there is no any leakage emissions from the project activity.

Hence, $LE_y = 0$

Therefore, Emission Reductions for this project activity are calculated as follows:

$$ER_y = BE_y - PE_y$$

where:

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

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

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

Therefore, Net GHG Emission Reductions and Removals are calculated as follows:

$$ER_y = BE_y - PE_y$$

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
Year 1	13,618	0	0	13,618
Year 2	13,522	0	0	13,522
Year 3	13,427	0	0	13,427
Year 4	13,331	0	0	13,331
Year 5	13,236	0	0	13,236
Year 6	13,140	0	0	13,140
Year 7	13,045	0	0	13,045
Total	93,319	0	0	93,319

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid, OM, y}
Data unit	tCO ₂ e/MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	CO ₂ Emission Database, Version 17.0, October - 2021 published by Central Electricity Authority (CEA), Government of India.
Value applied:	0.9522

Justification of choice of data or description of measurement methods and procedures applied	Calculated as the last 3-year (2018-19, 2019-20, 2020-21) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 17.0, October 2021 published by Central Electricity Authority (CEA), Government of India.
Purpose of Data	Calculation of baseline emissions
Comments	-

Data / Parameter	EF_{grid, BM, y}
Data unit	tCO ₂ e/MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	CO ₂ Emission Database, Version 17.0, October - 2021 published by Central Electricity Authority (CEA), Government of India.
Value applied:	0.8653
Justification of choice of data or description of measurement methods and procedures applied	Calculated as the last 3-year (2018-19, 2019-20, 2020-21) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 17.0, October 2021 published by Central Electricity Authority (CEA), Government of India.
Purpose of Data	Calculation of baseline emissions
Comments	-

Data / Parameter	EF_{grid, CM, y}
Data unit	tCO ₂ e/MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	CO ₂ Emission Database, Version 17.0, October 2021 published by Central Electricity Authority (CEA), Government of India.
Value applied:	0.9305

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 (tCO₂e/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM} = Weighting of build margin emissions factor (%) = 25%
Purpose of Data	Calculation of baseline emissions
Comments	-

5.2 Data and Parameters Monitored

Data / Parameter	$EG_{PJ, y}$
Data unit	MWh/y
Description	Quantity of net electricity displaced in year y as a result of the implementation of the project activity (MWh)
Source of data	Monthly Joint Meter Readings taken at the project site
Description of measurement methods and procedures applied	Each rooftop and ground mounted installation site has single or multiple metering points. The Joint Meter Readings (JMR) taken every month from each meter are added up to arrive at the net value of electricity supplied by the project proponents to each customer. The summation value metered energy as per the month forms the basis for the project proponents to raise monthly invoices to the individual customers.
Frequency of monitoring/recording	Continuous measurement & monthly recording

Value applied:	14,329 ²⁰	
Monitoring equipment	Type of meter	Energy meter
	Location of meter	Interconnection point/ Substation
	Accuracy of meter	0.5s or better
	Serial number of meters	It will be submitted during the verification.
	Calibration frequency	As per Central Electricity Authority (Installation and Operation of Meters) (Amendment) Regulations, 2019 ²¹ , all Interface Meters shall be tested on-site using accredited test laboratory for routine accuracy testing at least once in five years and recalibrated if required.
QA/QC procedures applied	Net electricity supplied to the grid by the project activity will be cross checked with the monthly invoices submitted by the project proponents to each individual customer.	
Purpose of data	Calculation of baseline emissions	
Calculation method	Each rooftop and ground mounted installation site has single or multiple metering points. The Joint Meter Readings (JMR) taken every month from each meter are added up to arrive at the net value of electricity supplied by the project proponents to each customer. The summation value metered energy as per the month forms the basis for the project proponents to raise monthly invoices to the individual customers. The list metering points along with the meter details at each installation units shall be produced during the time issuance. Apportioning Methodology in case the start date and end date of the monitoring period falls within the joint meter reading/ invoicing cycle, the generation shall be considered based on the daily generation readings recorded by the project proponent at the site.	
Comments	-	

²⁰ Estimated average value of the Net Generation (MWh/year) for the 1st crediting period

²¹ https://cea.nic.in/old/reports/regulation/CEA_metering_regulation_amendment_2019.pdf

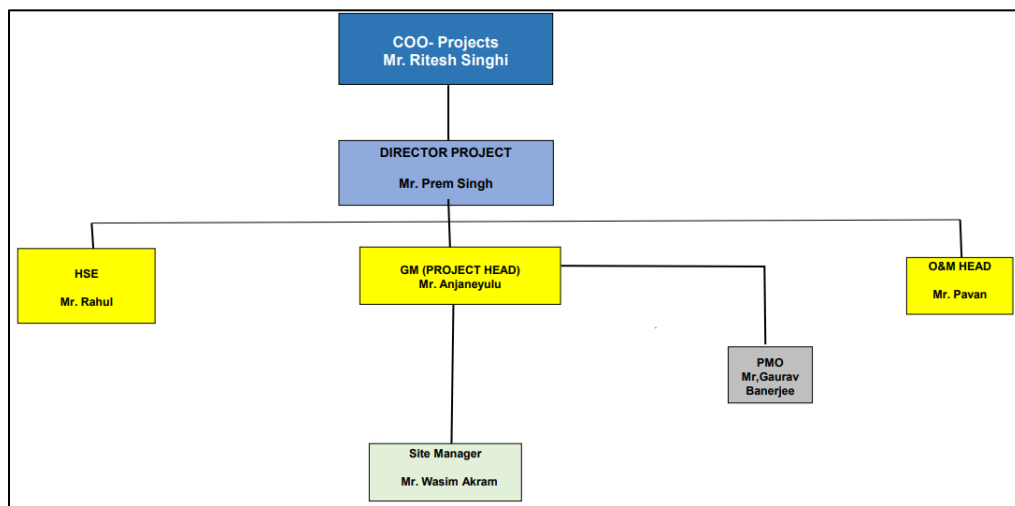
5.3 Monitoring Plan

The monitoring plan is developed in accordance with the modalities and procedures for the project activities. The monitoring plan, which will be implemented by the project participant describes about the monitoring organisation, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

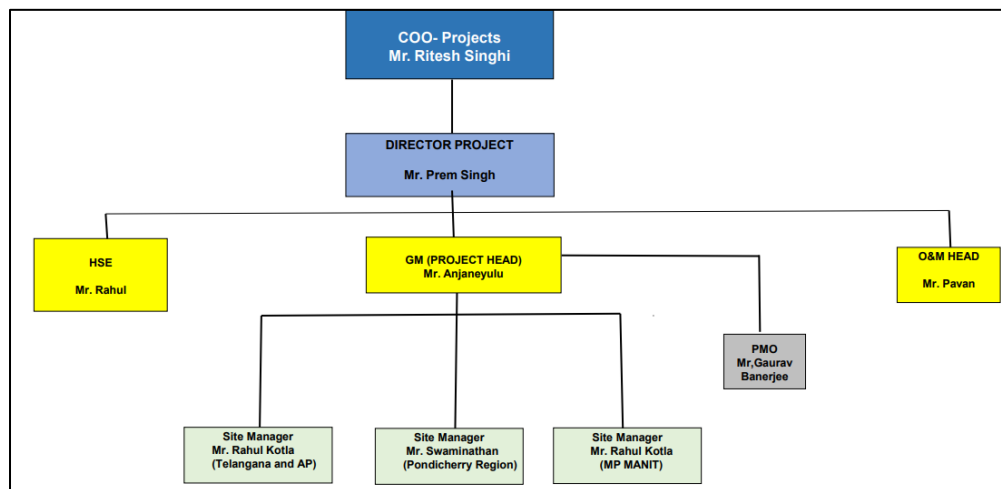
Organizational structure and responsibilities:

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the project proponents. The project proponents proposed the following structure for data monitoring, collection, data archiving and calibration of equipment for this project activity.

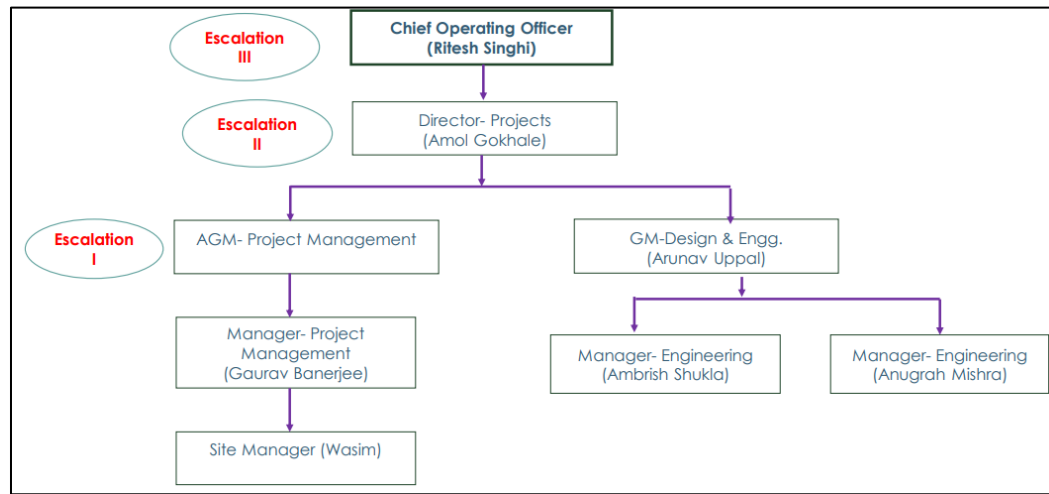
Kochi Metro Rail Limited Organizational Structure:



SECI Rooftop Organizational Structure:



Subros Limited Organizational Structure:



Roles and responsibilities of Site Managers:

- Oversee, manage, and direct construction projects from beginning to end
- Review and monitor the project in-depth
- Material tracking and delivery of all the material as per the schedule
- Prepare Project reports pertaining to the status of the Project
- Plan to prevent problems and resolve any emerging ones
- Train and give feedback to construction workers and subcontractors
- Ensure availability of required tools, materials and equipment
- Manage and mitigate risks
- Always ensure quality construction standards

Data Measurement

The net electricity displaced by project will be measured continuously using above mentioned energy meter located after inverters. Readings of meters shall be taken on monthly basis by authorized officer of developer in the presence of PP or representative of PP. In the event of failure of generation meter, the user energy meter or inverter generation value will be used in monitoring the electricity generation data.

Data collection and archiving

Readings from meters will be collected in the presence of the plant in-charge. Net electricity displaced by project 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 will be 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 will not result in any unidentified activity that can result in substantial emissions from the project activity. No need for emergency preparedness in data monitoring is visualized.

QA/ QC Procedures

Their energy meters of 0.5s or better accuracy class is installed at the respective project site. The calibration of all the meters will be undertaken at required intervals (once is five years as per CEA notification) and faulty meters will be duly replaced immediately. Records of calibration certificates will be maintained for verification purposes. Hence, a reliable method will be ensured with monitoring of the parameters. The invoice records will be used and kept for cross checking the consistency of the recorded data.

Sampling Approaches

Not required

Personnel training

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

6 ACHIEVED GHG EMISSION REDUCTIONS AND REMOVALS

6.1 Data and Parameters Monitored

Data / Parameter	EG _{PJ,y}
Data unit	MWh/y
Description	Quantity of net electricity displaced in year y as a result of the implementation of the project activity (MWh)
Value applied:	14,329

Comments

-

6.2 Baseline Emissions

Baseline emission is the product of Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity multiplied by the Combined margin CO₂ emission factor for grid connected power generation

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

where,

BE_y = Baseline Emissions in year y; tCO₂

$EG_{PJ, y}$ = 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)

$EF_{grid, y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool 07: Tool to calculate the emission factor for an electricity system Version 7.0” (tCO₂/MWh)

6.3 Project Emissions

As per methodology AMS I.F. Version 5.0, for renewable energy projects, there is no any project emissions occurred.

Hence, $PE_y = 0$

6.4 Leakage

As per methodology AMS I.F. Version 5.0, for renewable energy projects, there is no any leakage emissions occurred.

Hence, $LE_y = 0$

6.5 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
Year 2021	10,500	0	0	9,770
Total	10,500	0	0	10,500