



## Verification Report for

Project : 30 MW Solar Power Project TK SPL, Tamil Nadu, India.

UCR Project ID : 419

Name of Verifier	SQAC Certification Pvt. Ltd.
Date of Issue	April 22, 2024
Project Proponent	M/s IndiGrid Limited.
Work carried by	Mr. Santosh Nair
Work reviewed by	Mr. Praful Shinganapurkar

### Summary:

SQAC Certification Pvt. Ltd. has performed verification of the “30 MW Solar Power Project TK SPL, Tamil Nadu, India.” The project activity is developed at Village Alliyandal, Taluka Chengam, District Tirunannamalai, State Tamil Nadu, India. The purpose of the proposed project activity is to produce electricity through a sustainable and renewable energy source - solar radiation. Specifically, the project involves setting up and operating a total installed capacity of 30 MW of Solar PV plant.

### **The project activity meets the following UN SDG’s:**



Verification for the period: **31/03/2016 to 31/12/2023 (07 years, 08 months)**

The GHG emission reductions were calculated on the basis of UCR Protocols which draws reference from UCR Protocol Standard Baseline & Emission Factor and Type I (Renewable Energy Projects) UNFCCC Methodology Category ACM0002: Grid-connected electricity generation from renewable sources - Version 21.0. The verification was done remotely by way of video calls / verification, phone calls and submission of documents for verification through emails.

Accredited by 5 Jupiter House, Callera Park, Aldermaston, Reading Berkshire RG7 8NN, United Kingdom (UK).

India Office: Off. No. 4, Fifth Floor, Buildmore Business Park, New Canca Bypass Road, Khorlim, Mapusa, Goa – 403 507

Web: [www.sqac.in](http://www.sqac.in)

Email: [info@sqac.in](mailto:info@sqac.in) Tel: 7219716786 / 87





SQAC is able to certify that the emission reductions from the 30 MW Solar Power Project TKSPL, Tamil Nadu, India, (UCR ID – 419) for the period **31/03/2016 to 31/12/2023** amounts to **3,69,995 CoUs (3,69,995 tCO<sub>2</sub>eq)**

**Detailed Verification Report:**

**Purpose:**

The project activity titled 30 MW Solar Power Project TKSPL, Tamil Nadu, India is a ground mounted renewable solar energy project located in Village Alliyandal, Taluka Chengam, District Tirunannamalai, State Tamil Nadu, India.

Village	Taluka	District	State	Type	Total installed capacity MW	Commissioning Date
Alliyandal	Chengam	Tirunannamalai	Tamil Nadu	Ground mounted	30	26.03.2016

The project has a total installed capacity of 30 MW of Solar PV plant and utilizes photovoltaic (PV) technology to harness solar energy for electricity generation.

The project is promoted by Terralight Kanji Solar Private Limited (TKSPL), which belongs to INDIGRID also called the Project Proponent or PP. PP has the full ownership of the project activity.

The Project activity is a new facility (Greenfield) and the electricity generated by the project will be exported to the Indian electricity grid. The project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. The project is a bundled project activity which involves installation of 30 MW solar projects.

The objective of the proposed project is to generate electricity using a clean and renewable source of energy i.e., solar radiation. The project activity displaces grid electricity consumption (e.g. grid import) at the user end. The project activity generated **4,11,110 MWh** of renewable electricity over the entire monitored period.

The commissioning date of the project activity is 26.03.2016.



## Commissioning Certificate

**TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LTD**

From  
Er.M.Noormohamed, B.E., MIE.,  
Superintending Engineer,  
TEDC/Thiruvannamalai

To  
✓ M/s Shapoorji Pallonji Solar PV Pvt Ltd,  
Alliyandal Village,  
Chengam Taluk,  
Thiruvannamalai Dt.,

**Lr.No. SE/TEDC/T.V.malai/AEE/Dev/AE/Solar/D.No.322/16,dt, 29.03.2016.**

Sir,

Sub: TEDC- Solar EHT SC.No.001-Commissioning on 26.03.2016 intimation – Reg.

Ref: 1. Memo.No.DIR/GEN/CE/NCES/SE/Solar/EE/SCB/AEE2/FMS Shapoorji/D.254/16,dt,24.03.2016.

2. Lr.No.EE/O&M/CGM/DM/.Solar/D.No.334/16,dt,26.03.2016

3. Lr.No.EE/O&M/CGM/DM/F.Test Report/D.No.337/15-16, dt,24.3.16.

\*\*\*\*\*

30MW Capacity Solar Power Plant of M/s Shapoorji Pallonji Solar PV Pvt Ltd, at Alliyandal Village, Chengam Taluk, Thiruvannamalai has been commissioned on 26.03.2016. the Particulars of Generation are as below.

Sl.No,	Village	Capacity	HT SC No. & Date of Commissioning
1	Alliyandal Village Chengam Taluk Thiruvannamalai Dt	30 MW	TVM Solar EHT SC No. 001 Dt, 26.03.2016.

Superintending Engineer,  
TEDC/Thiruvannamalai.

Copy to the Executive Engineer/O&M/Chengam.  
Copy to the Assistant Executive Engineer/O&M/Pudupalayam  
Copy to the Deputy Financial Controller/Central Office/T.malai & Accounts Officer / Rev/ CO/T.Malai.





The total GHG emission reductions achieved in this monitoring period is as follows:

<b>Summary of the Project Activity and ERs Generated for the Monitoring Period</b>	
Start date of this Monitoring Period	31/03/2016
Carbon credits s (CoUs) claimed up to	31/12/2023
Total ERs generated in this crediting period (tCO <sub>2eq</sub> )	3,69,995 tCO <sub>2eq</sub> (expressed as CoUs)
Project Emission	0
Leakage	0

As per the UNFCCC Methodology, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

“The electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.”

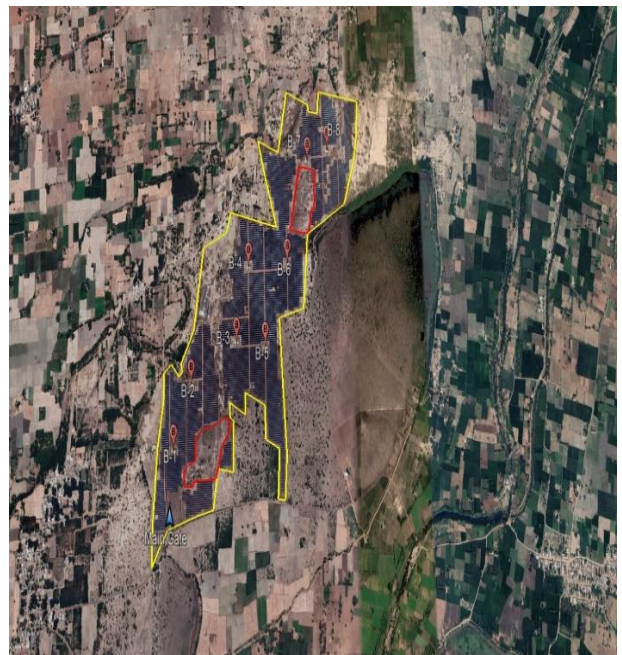
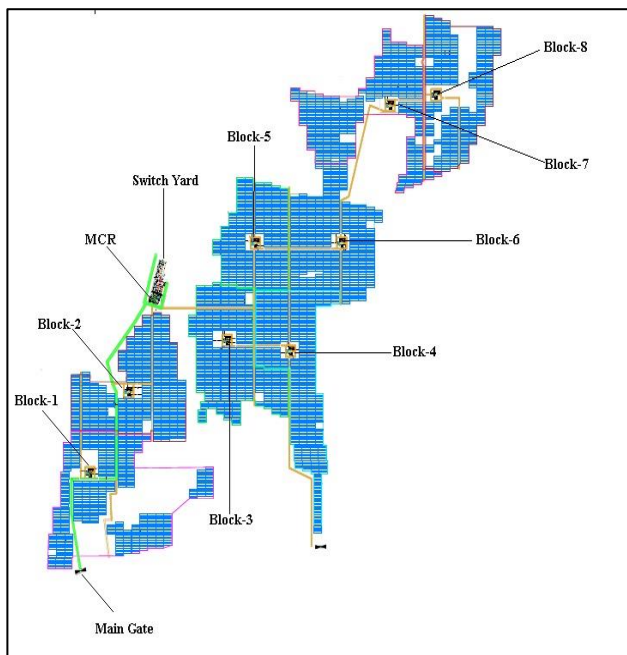
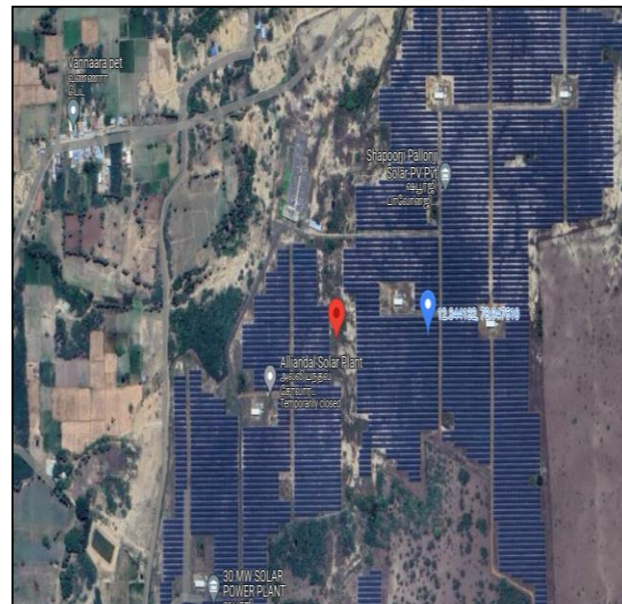
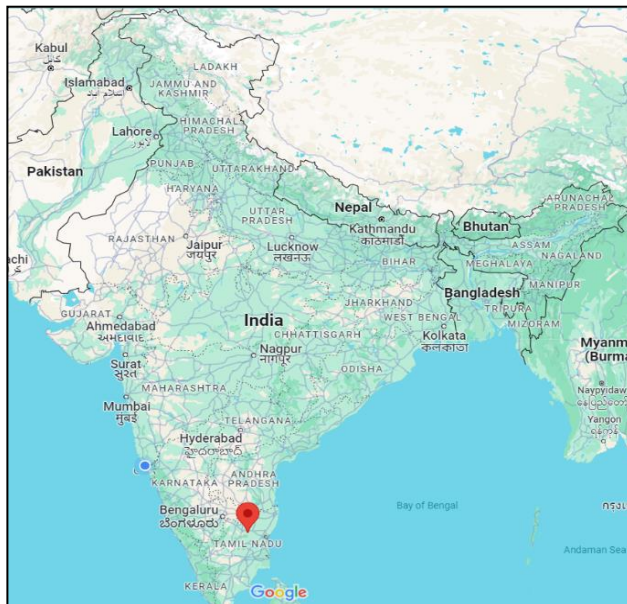
#### **Methodology key elements**

<b>Typical project(s)</b>	Retrofit, rehabilitation (or refurbishment), replacement or capacity addition to an existing power plant or construction and operation of a new power plant/unit that uses renewable energy sources and supplies electricity to the grid. Battery energy storage system can be integrated under certain conditions
<b>Type of GHG emissions mitigation action</b>	Renewable energy: Displacement of electricity that would be provided to the user(s) by more-GH-intensive means.



**Location of project activity:**

Country : India.  
District : Tirunannamalai  
Village : Alliyandal  
Taluka : Chengam  
State : Tamil Nadu  
Latitude : 12.3441527797 "N  
Longitude : 78.9459970541 E  
Project Commissioning Year : 26.03.2016



**Scope:**

The scope covers verification of emission reductions from the project 30 MW Solar Power Project TKSPL, Tamil Nadu, India, (UCR ID – 419)

**Criteria:**

Verification criteria is as per the requirements of UCR Standard.

**Description of project:**

The aim of this project is to produce electricity through solar radiation, a clean and renewable energy source. By installing and operating a 30 MW solar power plant in Tirunnamalai district, Tamil Nadu, the project replaces the consumption of grid electricity at the user end. This large-scale project utilizes solar photovoltaic technology, which is known for its environmentally friendly operation, emitting no greenhouse gases or harmful substances unlike traditional power plants.

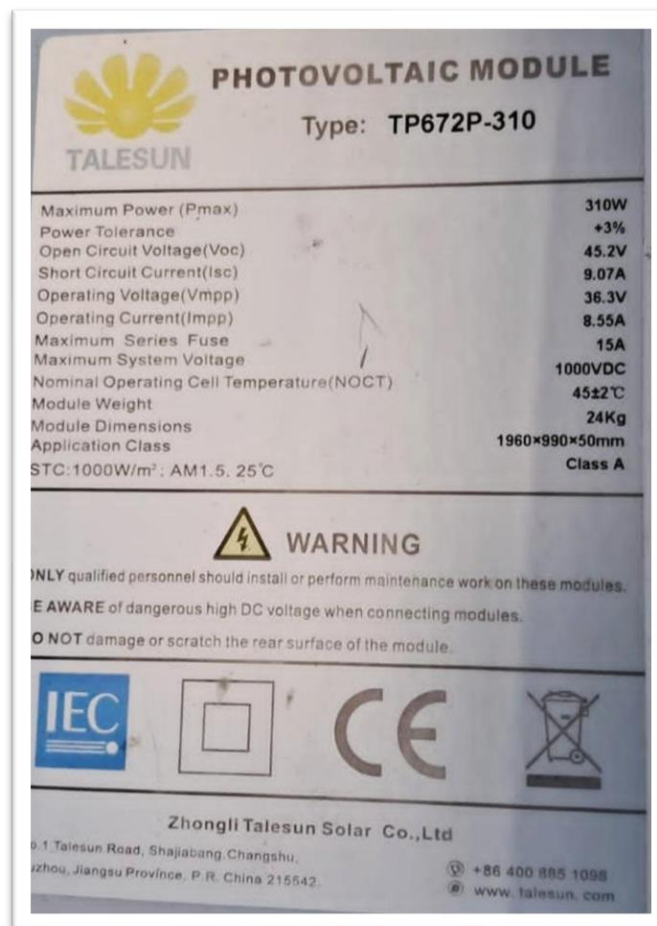
<b>Installed Total Capacity</b>	<b>Village</b>	<b>District</b>	<b>State</b>	<b>Type</b>	<b>Coordinates</b>	<b>Commissioning Date</b>
30 MW	Alliyandal	Tirunannamalai	Tamil Nadu	Ground mounted	12.3441527797"N 78.9459970541 "E	26.03.2016

In contrast to fossil fuel-fired power plants, the technology utilized in this project poses no environmental threat. It is a proven and reliable technology, ensuring safety and soundness in its application. Importantly, the project does not entail the transfer of technology from any Annex 1 country, nor does it receive any public funding from Official Development Assistance (ODA) or Annex I countries.

<b>Parameter</b>	<b>Description</b>
	<b>30 MW</b>
Total number of Photovoltaic Modules	116172
Rating of Photovoltaic Module	310 Wp
Module Make	Crystalline (TP672P-310)
Technology	Poly Crystalline Silicon
Solar Panel Maker	JA Solar



Commissioning Date	26.03.2016
EHT SC No.	001
Inverter model no.	PVS-800-57-1000kW-C
Inverter Rooms	8
Inverter Transformer Make	Shilchar Technologies Limited
Rating	2200/1100 - 1100



The project activity displaces electricity from an electricity distribution system that is 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 a national or a regional grid (grid hereafter).






## United Nations Sustainable Development Goals:

The project generates electrical power by harnessing solar energy through photovoltaic cells, effectively replacing non-renewable fossil resources. This transition contributes to sustainable economic and environmental development. Without the project, the equivalent power generation would have relied on fossil fuel-dominated power stations.

Consequently, the renewable energy generation from the project leads to a reduction in greenhouse gas emissions. Positive contribution of the project to the following Sustainable Development Goals:

- ✓ SDG13: Climate Action
- ✓ SDG 7: Affordable and Clean Energy
- ✓ SDG 8: Decent Work and Economic Growth

Development Goals	Targeted SDG	Target Indicator (SDG Indicator)
 <p><b>13 CLIMATE ACTION</b></p> <p>SDG 13: Climate Action</p>	<p>13.2: Integrate climate change measures into national policies, strategies and planning</p> <p>Target: <b>3,69,995 tCO<sub>2</sub></b> avoided for the Monitored Period 01</p>	<p>13.2.1: Number of countries that have communicated establishment or operationalization of an integrated policy/ strategy/ plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)</p>
 <p><b>7 AFFORDABLE AND CLEAN ENERGY</b></p> <p>SDG 7: Affordable and Clean Energy</p>	<p>7.2: By 2030, increase substantially the share of renewable energy in the global energy mix</p> <p>Target: <b>4,11,110 MWh</b> renewable power supplied for the Monitored Period 01</p>	<p>7.2.1: Renewable energy share in the total final energy consumption</p>
 <p><b>8 DECENT WORK AND ECONOMIC GROWTH</b></p> <p>SDG 8: Decent Work and Economic Growth</p>	<p>8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value</p> <p>Target: Training, O&amp;M staff</p>	<p>8.5.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities</p>



**Level of Assurance:**

The verification report is based on the information collected remotely by way of video calls / verification, phone calls and submission of documents for verification through emails like Project Concept Note (PCN) / Monitoring Report (MR), submitted to SQAC. The verification opinion is assured provided the credibility of all the above.

Review of the following documentation was done by SQAC Lead Verifier Mr. Santosh Nair who is experienced in such projects.

**Documentation Verified:**

- Project Concept Note (PCN)
- Monitoring Report (MR)
- Commissioning Certificate
- Calibration Certificate
- Solar Panel layout
- Power Purchase Agreement
- JMR's
- Invoices
- Data provided upon request of all the documents of the related project.

**Sampling:**

Not applicable

**Persons interviewed:**

1. Mr. Ramchandran : DGM – Asset Maintenance, M/s IndiGrid Limited.
2. Mr. Hariharan – Engr (O&M) – M/s Skyfree (O&M Contractor)



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## STAND BY METER

E.T.S.C NO : TVM SOLAR 001  
INSTALLED CAPACITY 30MW  
MF = 200000  
S.NO : 1619319  
D.O.C = 26-03-2016

 **PHOTOVOLTAIC MODULE**  
Type: TP672P-310

Maximum Power (P <sub>max</sub> )	310W
Power Tolerance	+3%
Open Circuit Voltage (V <sub>oc</sub> )	45.2V
Short Circuit Current (I <sub>sc</sub> )	9.07A
Operating Voltage (V <sub>mpp</sub> )	36.3V
Operating Current (I <sub>mpp</sub> )	8.55A
Maximum Series Fuse	15A
Maximum System Voltage	1000VDC
Nominal Operating Cell Temperature (NOCT)	45±2°C
Module Weight	24Kg
Module Dimensions	1960×990×50mm
Application Class	Class A
STC-1000W/m <sup>2</sup> ; AM1.5, 25°C	

 **WARNING**  
ONLY qualified personnel should install or perform maintenance work on these modules.  
BE AWARE of dangerous high DC voltage when connecting modules.  
DO NOT damage or scratch the rear surface of the module.

Zhongli Talesun Solar Co., Ltd  
No. 1 Talesun Road, Shajiang, Chengde,  
Sichuan, Jiangsu Province, P.R. China 215662  
+86 400 885 1038  
www.talesun.com



**SHAPOORJI PALLONJI SOLAR PV PRIVATE LIMITED**  
 Regd. Office: No. 70, Nagendra Master Road, Fort Mumbai, 400 023  
 Admin & Branch Office: Survey Unit No. 14, Third Cross Street, Raja Annamalaipuram, Chennai-600 026, Tamil Nadu  
 Project Office: Survey No. 21-A, Alityandhal Village, Chengam Taluk, Tiruvannamalai District, 606 702, Tamil Nadu  
 GSTIN: 33AAOC2453A2ZN

**Bill of Supply**

Invoice No: SPSVP/012/19-20	Product Description: Electric Energy	State: Tamil Nadu
Date of Issue: 31-Mar-20	HSN Code: 2716.00.00	State Code: 33

<b>Details of Receiver / Billed to</b>		<b>Details of Consigner / Shipped to</b>	
Name: The Superintending Engineer	Name: The Superintending Engineer		
Address: Thiruvannamalai Electricity Distribution Circle	Address: Thiruvannamalai Electricity Distribution Circle		
TANGEDCO, Thiruvannamalai	- Circle, TANGEDCO, Thiruvannamalai		
GSTIN / UIN: 33AADCT4784E12C	GSTIN / UIN: 33AADCT4784E12C		
State: Tamil Nadu	State: Tamil Nadu		
Code: 33	Code: 33		

**Bill of Supply for Energy generated and delivered from our 30MW Solar Power Plant at Alityandhal TVM Solar EHT SC No. 001**

Period of Supply - From	01-Mar-2020	No. of days in billing period	31.00
To	31-Mar-2020		

Units Exported (kWh)	5,568,000
Units Imported (kWh)	30,000
Net Units exported (kWh)	5,568,000
RKVahr (Import)	28,000
Rate per kWh	7.01
Net Generation Charges	39,017,660
Due Date for Payment Of Bill	31-May-2020
Less RKVahr Charges	4060
Negative Energy Charges	191643
Less Meter Reading Charges	200
Net Value of Supply Rs	38,821,757

Value in words: **Rs. Three Crore Eighty Eight Lakhs Twenty One Thousand Seven Hundred and Fifty Seven rupees only.**

Note: A) As per Article 6(b) of the Energy Purchase Agreement, any delayed payment beyond the Due Date for payment of this bill shall attract interest at the rate of 1% (one percent).  
 Note: B) GST is Nil under HSN code No.2716.00.00  
 Cheque in favour of SHAPOORJI PALLONJI SOLAR PV PRIVATE LIMITED.

**For Shapoorji Pallonji Solar PV Pvt. Ltd.,**  
 SARAVANA KUMAR.S  
 MANAGER-O & M

Shapoorji Pallonji Solar PV Pvt. Ltd.  
 Corporate Identification No. U40300MH2010PTC202812  
 Corporate Office: SP Centre, 41-44, Maroo Desai Marg, Colaba, Mumbai 400005.  
 (T) +91 22 4740 0000 (F) +91 22 4740 0017 website: www.spgroup.co.in  
 Branch Office: "SREYAS VIRAT" No. 14, First Floor, Third Cross Road,  
 Raja Annamalaipuram, Chennai - 600 026.  
 (T) +91 44 2425 3035 (F) +91 44 2425 3038  
 Regd. Office: 70, Nageshwar Master Road, Fort, Mumbai - 400 023.

Final Statement Date	31/03/2020	Category/Type/SS	SALE-TO-BOARD / TANGEDCO OWN SS
Machine Capacity (kw)	30000	Injecting Voltage	110KV

Import Slot				Export Slot				
Initial Reading	Final Reading	Difference	kwh(Unit)	Initial Reading	Final Reading	Difference	kwh (Unit)	Net
C1 0.12	0.12	0	0	136.8	140.19	3.39	678000	678000
C2 1.87	1.91	.04	8000	0.19	0.19	0	0	0
C3 0.63	0.64	.01	2000	0.0	0.0	0	0	0
C4 0.97	0.98	.01	2000	902.67	927.12	24.45	489000	488800
C5 4.29	4.38	.09	18000	0.06	0.06	0	0	0

**Generation Summaries**

	Initial	Final	Difference	Units
rKvahr	86.97	87.11	14	28000
Kvahr	8.81	8.98	27.69	5538000
Total Import				30000
Total Export				5568000
Tariff	SOLAR		7.01	Rs.39017660

**Applicable Charges (Rs)**

Charge Code	Charge Description	Total Charges
C005	RKVahr Penalty	4060
C006	Negative Energy Charges	191643
C008	Other Charges	0
C001	AMR Meter Reading Charges	200
	Net Applicant Charges	Rs.38821757

To: - M/S. MS Shapoorji Pallonji  
**For Shapoorji Pallonji Solar PV Pvt. Ltd.,**  
 SARAVANA KUMAR.S  
 MANAGER-O & M

for SUPERINTENDING ENGINEER/EDC/THIRUVANMALAI

**Shapoorji Pallonji Solar PV Private Limited**  
 Regd. Office: 70, Nagendra Master Road, Fort Mumbai, 400 023  
 Admin & Branch Office: Survey Unit No. 14, Third Cross Street, Raja Annamalaipuram, Chennai-600 026, Tamil Nadu  
 Project Office: Survey No. 21-A, Alityandhal Village, Chengam Taluk, Tiruvannamalai District, 606 702, Tamil Nadu  
 GSTIN: 33AAOC2453A2ZN

**Bill of Supply**

Invoice No. TN1000000003	Product	SALE OF POWER ITEMS	State	Tamil Nadu
Date of Issue 03.07.2023	HSN Code	27160000	State	33
IPM No. 43262538664886a1c564b913347504df101773c8aac	Ack No.	152315025120320		
IPM Status	ACK	2023-07-03 12:47:00		

<b>Details of Receiver/Billed to</b>		<b>Details of Consigner/Shipped to</b>	
The Superintending Engineer, (Solar Energy) 2nd Floor, Eastern Wing, No:144 Anna Salai, Chennai-600 002		The Superintending Engineer, (Solar Energy) 2nd Floor, Eastern Wing, No:144 Anna Salai, Chennai-600 002	
GSTIN/UIN: 33AADCT4784E12C		GSTIN/UIN: 33AADCT4784E12C	
State: Tamil Nadu, State Code: 33		State: Tamil Nadu, State Code: 33	

**Bill of Supply for Energy generated and Delivered from our 30MW Solar Power Plant at Alityandhal, Thiruvannamalai EHT SC No: 028414140001**

Period of Supply - From	01.06.2023	No. of Days in Billing	30
To	30.06.2023		

Units Exported (kWh)	443238.0000
Units Imported (kWh)	32000.0000
Net Units Exported (kWh)	442251.0000
RKVahr Units	404000
Rate per kWh	7.01
Net Generation Charges	31002842.51
Due Date for Payment of	01-SEP-2023
Less RKVahr Charges	46660.00
Less Meter Reading Charges	400.00
Less Negative Energy Charges	157062.00
Less Other Charges	
Net Value of Supply Rs.	30777960.51
TCS@4 u/s 206C1(H) of I.T.	0.00
Net Invoice value Rs.	30777960.51

Value in Words (Rupees): **THREE CRORE SEVEN LAKH SEVENTY SEVEN THOUSAND NINE HUNDRED SIXTY RUPEES FIFTY ONE Paise Only**

Note: A) As per Article 6(b) of the Energy Purchase Agreement, any delayed payment beyond the Due Date for payment of this bill shall attract interest at the rate of 1% (one percent).  
 Note: B) GST is Nil under HSN code No.2716.00.00  
 Cheque in favour of SHAPOORJI PALLONJI SOLAR PV PVT LTD

**For Shapoorji Pallonji Solar PV Private Limited**  
 AUTHORIZED SIGNATORY  
 SAP No. : 1070000421

03 Jul 2023 14:30

**TAMIL NADU GENERATION AND DISTRIBUTION CORPORATION LIMITED**  
**OFFICE OF THE SUPERINTENDING ENGINEER/ THIRUVANMALAI**  
**Statement Showing the Energy Generated for June,2023**

Company Name	M/s. Shapoorji Pallonji Solar PV Private Limited	Generation Date	03/07/2023
Service Number/hsrcc	02914140001/Non-Rcc	Multiplication Factor	200000
Initial Statement Date	01/06/2023	Net Generation (units)	4422551
Final Statement Date	30/06/2023	Category/Type/SS	STB / SECTION 10(I)SS
Machine Capacity (kw)	30000	Injecting Voltage/Loss percent(%)	110KV / 0.213

Import Units				Export Units				
Initial Reading	Final Reading	Difference	kwh(Unit)	Initial Reading	Final Reading	Difference	kwh(Unit)	Net
C1 0.19	0.19	0	0	283.24	288.08	4.84	965938	965938
C2 3.53	3.58	.05	10000	0.24	0.27	.03	5987	0
C3 1.03	1.03	0	0	0.0	0.0	0	0	0
C4 1.61	1.63	.02	4000	1628.27	1645.61	17.34	3460613	3456613
C5 7.77	7.86	.09	18000	0.06	0.06	0	0	0

**Net Units**

C1: 965938 C2: 0 C3: 0 C4: 3456613 C5: 0

**Generation Summaries**

	Initial	Final	Difference	Units
rKvahr	101.44	103.46	2.02	404000
Kvahr	15.88	16.05	22.12	4424000
Total Import				32000
Total Export				4432538
Tariff	SOLAR		7.01	Rs.31002082.51

**Applicable Charges (Rs)**

Charge Code	Charge Description	Total Charges
C001	AMR Meter Reading Charges	400
C005	RKVahr Penalty	66660
C006	Import Energy Charges   Lec- 149293.69 Tax- 7767.98	157062
C008	Other Charges	0
	Net Applicant Charges	Rs.30777960.51

To: - M/S. M/s Shapoorji Pallonji Solar PV Private Limited  
 for SUPERINTENDING ENGINEER/EDC/THIRUVANMALAI



**GLOBAL EPC INDIA PRIVATE LIMITED**  
 D-No:11-269, Sree Harsha Complex, Tulsi Nagar, Vijayawada, Krishna District, Andhra Pradesh - 520007.  
 Phone: 0866 2556066 Mobile: 8903476163, 91500 12150, 94864 11833  
 E-mail: info@globalepc.in, globalepcindia@gmail.com  
 website: www.globalepc.in



**CALIBRATION CERTIFICATE**  
 ULR No. :- CC302223000001732F  
 Calibration Certificate Number :- GEP/2023-24/302/CC/1732  
 Calibration Certificate Issue Date :- 20-Jul-2023  
 Calibrated On :- 20-Jul-2023  
 Recommended Calibration Due :- 20-Jul-2024  
 Page 1  
 No. of Pages 3

(1) Customer Name & Address :- M/s. Terra Light Kanji Solar Pvt Ltd., 30MW Solar Plant, Aliyandhal - Village, Chengam (TK), Tiruvannamalai (Dt) - 666705, HTSC:029414140001

(2) Customer's Reference :- SRF No. :- 2023-24/302 Date :- 20-Jul-2023  
 (3) Calibration Location :- AT Permanent Laboratory - [ ] AT Onsite [x]  
 Location Name :- Control Room  
 Terra Light Kanji Solar Pvt Ltd.

(4) Details of Equipment Under Calibration :-  
 Name :- Electronic Trivector Energy Meter  
 Make :- Larsen & Toubro Limited. EUC Received Date :- 20-Jul-2023  
 Model :- ER300P EUC Condition on Receipt :- Satisfactory  
 Type :- P3E Calibration Procedure No. :- GEPCCP-04  
 SLNo. :- 16193197 Meter Constant :- 50000(imp / kWh)  
 Class :- 0.2S Unit :- (kWh, kWhArh)  
 Voltage :- 3 x 63.5 V (P-N) GEPC Seal No. :- G0005722  
 Current :- Ib 1A Imax 2A  
 Frequency :- 50 Hz

(5) Environmental Conditions :- Temperature :- 25.7-28.2 °C Humidity :- 52-54 %  
 (6) Witnessed by :-  
 Department/Company Name Signature  
 AE / MTR / METERING / TIRUVANNAMALAI Er. C. Purnasany  
 JE / O&M / Karapattu Er. V. Suresh  
 Deputy Manager / Virescent Terra Light Kanji Solar Pvt Ltd. Mr. Mohanraju

Prepared by S. Suresh (Calibration Engineer)  
 Checked by S. Suresh (Calibration Engineer)  
 Approved by S. Suresh Singh (Director Technical)



**GLOBAL EPC INDIA PRIVATE LIMITED**  
 D-No:11-269, Sree Harsha Complex, Tulsi Nagar, Vijayawada, Krishna District, Andhra Pradesh - 520007.  
 Phone: 0866 2556066 Mobile: 8903476163, 91500 12150, 94864 11833  
 E-mail: info@globalepc.in, globalepcindia@gmail.com  
 website: www.globalepc.in



**CALIBRATION CERTIFICATE**  
 ULR No. :- CC302223000001732F  
 Calibration Certificate Number :- GEP/2023-24/302/CC/1732  
 Calibration Certificate Issue Date :- 20-Jul-2023  
 Calibrated On :- 20-Jul-2023  
 Recommended Calibration Due :- 20-Jul-2024  
 Page 2  
 No. of Pages 3

(7) Details of Standard Equipments used :-

Sl. No.	Name	Make	Serial No.	Calibrated at	Certificate No.	Validity
(1)	Three Phase Portable Test Equipment	Applied Precision Ltd.	2619030275	National Standard Through Accredited by NABL, CC-2216	C&I/CAL/22-01/175	29-Jan-2024

(8) Results :- For Electronic Trivector Energy Meter Active & Reactive Energy Mode Error Calibration, As Per IS 14697:2021, Clause 11.1 and Table 11 Limits of Error Due to Variation of the Current.  
 IMPORT MODE / EXPORT MODE  
 3 Phase 4 Wire Balance Mode Active / Reactive Energy Measurement at 50Hz:-  
 (3 Phase Voltage & 3 Phase Current Applied for Balance Mode)

Sl.No. :- 16193197	Applied Voltage (Volts)	Applied Current (Amps)	Cosφ / Sin φ	IMPORT MODE				EXPORT MODE				Specified Error Limits In a (%)	Expanded Uncertainty In (%)	Coverage Factor (k)	
				% Error	Reactive % Error	Active % Error	Reactive % Error	% Error	Reactive % Error	Active % Error	Reactive % Error				
1	3 x 63.5 1 % Ib	-0.021	-0.057	-0.026	-0.033	0.40	0.07	2.00							
	3 x 63.5 2 % Ib	0.009	-0.016	0.006	-0.008	0.40	0.07	2.00							
	3 x 63.5 3 % Ib	0.003	-0.016	-0.002	-0.011	0.20	0.07	2.00							
	3 x 63.5 10 % Ib	-0.010	-0.024	-0.009	-0.025	0.20	0.07	2.00							
	3 x 63.5 20 % Ib	0.004	-0.015	-0.003	-0.014	0.20	0.07	2.00							
	3 x 63.5 50 % Ib	0.019	0.006	0.005	0.011	0.20	0.07	2.00							
	3 x 63.5 100 % Ib	-0.040	0.010	-0.020	-0.025	0.20	0.07	2.00							
	3 x 63.5 Imax	-0.013	-0.011	-0.016	-0.020	0.20	0.07	2.00							
	3 x 63.5 2 % Ib	0.031	-0.191	0.022	-0.162	0.50	0.07	2.00							
	3 x 63.5 5 % Ib	0.001	-0.154	-0.003	-0.148	0.50	0.07	2.00							
	3 x 63.5 10 % Ib	-0.045	-0.114	-0.045	-0.117	0.30	0.07	2.00							
	3 x 63.5 20 % Ib	0.028	-0.196	0.023	-0.196	0.30	0.07	2.00							
	3 x 63.5 50 % Ib	-0.048	-0.067	-0.044	-0.073	0.30	0.07	2.00							
	3 x 63.5 100 % Ib	-0.048	-0.178	-0.047	-0.182	0.30	0.07	2.00							
	3 x 63.5 Imax	-0.063	-0.120	-0.050	-0.130	0.30	0.07	2.00							
	3 x 63.5 2 % Ib	0.000	0.035	0.009	0.015	0.50	0.07	2.00							
	3 x 63.5 5 % Ib	0.007	0.027	0.002	0.034	0.50	0.07	2.00							
	3 x 63.5 10 % Ib	0.012	0.002	0.008	0.005	0.30	0.07	2.00							
	3 x 63.5 20 % Ib	-0.008	0.039	-0.014	0.042	0.30	0.07	2.00							
	3 x 63.5 50 % Ib	0.017	0.029	0.011	0.023	0.30	0.07	2.00							
	3 x 63.5 100 % Ib	0.052	0.042	0.000	0.002	0.30	0.07	2.00							
	3 x 63.5 Imax	-0.008	0.019	-0.011	0.017	0.30	0.07	2.00							

Conclusions :- The Meter Error is found within specified Limit as per IS 14697:2021.  
 Prepared by S. Suresh (Calibration Engineer)  
 Checked by S. Suresh (Calibration Engineer)  
 Approved by S. Suresh Singh (Director Technical)



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**CALIBRATION CERTIFICATE**  
 ULR No. :- CC302223000001732F  
 Calibration Certificate Number :- GEP/2023-24/302/CC/1732  
 Calibration Certificate Issue Date :- 20-Jul-2023  
 Calibrated On :- 20-Jul-2023  
 Recommended Calibration Due :- 20-Jul-2024  
 Page 3  
 No. of Pages 3

(9) Observation and Remarks:-  
 (a) Verification of Average Frequency for each successive 15-minute block.  
 (As per customer requirement and procedure as per Clause No. 6.9 (c) (1) of CBIP Publication No. 304 and CBIP publication No. 325.)

Requirements as Per Specification	Observations
Frequency at 48.5Hz, 49.5Hz and 50.5Hz for 5 minutes each at Vref, Ib and UPF given to meter and verify the average frequency stored in the meter's memory in 15 minutes slot.	Satisfactory

(b) Verification of Reactive energy High reading (Voltage above 103%) and Reactive energy Low reading (Voltage below 97%).  
 (As per customer requirement and procedure as per Clause No. 6.1 (c) (iv) and (v) of CBIP Publication No. 304 & CBIP publication No. 325.)

Requirements as Per Specification	Observations
The Net Reactive energy was measured below 97 % of Vref [for Low kWhArh register] and above 103% of Vref (for High kWhArh register) at Ib, 0.5 Lag P.F and 0.8 Lead P.F in Forward & Reverse Direction.	Increment at 0.5 Lag P.F, Decrement 0.8 Lead P.F observed in kWhArh Low register at Forward Direction. Decrement at 0.5 Lag P.F, Increment 0.8 Lead P.F observed in kWhArh High register at Forward Direction. Increment at 0.5 Lag P.F, Decrement 0.8 Lead P.F observed in kWhArh Low register at Reverse Direction. Decrement at 0.5 Lag P.F, Increment 0.8 Lead P.F observed in kWhArh High register at Reverse Direction.

- (c). The reported expanded uncertainty in measurement is stated as the standard uncertainty in measurement multiplied by the coverage factor k = 2, which for normal distribution corresponding to a coverage probability of approximately 95%.
- (d). EUC - Equipment Under Calibration.
- (e). The Calibration Certificate relates only to the above EUC.
- (f). The reported uncertainty applies only to the measured values and gives no indication of the long term stability of device.
- (g). Any Error in this Certificate should be brought to our knowledge Within 45 days from the issue date of this Certificate.
- (h). Environmental and other Conditions mentioned in this Certificate.
- (i). Calibration Points and other requirements mentioned as per Customer's.

Prepared by S. Suresh (Calibration Engineer)  
 Checked by S. Suresh (Calibration Engineer)  
 Approved by S. Suresh Singh (Director Technical)



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(1) Customer Name & Address :- M/s. Terra Light Kanji Solar Pvt Ltd., 30MW Solar Plant, Aliyandhal - Village, Chengam (TK), Tiruvannamalai (Dt) - 666705, HTSC:029414140001

(2) Customer's Reference :- SRF No. :- 2023-24/302 Date :- 20-Jul-2023  
 (3) Calibration Location :- AT Permanent Laboratory - [ ] AT Onsite [x]  
 Location Name :- Control Room  
 Terra Light Kanji Solar Pvt Ltd.

(4) Details of Equipment Under Calibration :-  
 Name :- Electronic Trivector Energy Meter  
 Make :- Larsen & Toubro Limited. EUC Received Date :- 20-Jul-2023  
 Model :- ER300P EUC Condition on Receipt :- Satisfactory  
 Type :- 3Phase 4Wire Calibration Procedure No. :- GEPCCP-04  
 SLNo. :- 15624857 Meter Constant :- 50000(imp / kWh)  
 Class :- 0.2S Unit :- (kWh, kWhArh)  
 Voltage :- 3 x 63.5 V (P-N) GEPC Seal No. :- G0005741  
 Current :- Ib 1A Imax 2A  
 Frequency :- 50 Hz

(5) Environmental Conditions :- Temperature :- 25.7-28.2 °C Humidity :- 52-54 %  
 (6) Verified by :-  
 Department/Company Name Signature  
 AE / MTR / METERING / TIRUVANNAMALAI Er. C. Purnasany  
 JE / O&M / Karapattu Er. V. Suresh  
 Deputy Manager / Virescent Terra Light Kanji Solar Pvt Ltd. Mr. Mohanraju

(7) This calibration certificate documents the traceability to national standards, which make the use of measurements according to the International System of Units (SI). This calibration certificate may not be reproduced other than in full except with the permission of the issuing laboratory. Calibration certificate without signature are not valid.

Prepared by S. Suresh (Calibration Engineer)  
 Checked by S. Suresh (Calibration Engineer)  
 Approved by S. Suresh Singh (Director Technical)





## Application of methodologies and standardized baselines

### References to methodologies and standardized baselines

SECTORAL SCOPE – 01 Energy industries (Renewable/Non-renewable sources)

TYPE I – Renewable Energy Projects

Applied UNFCCC CDM Modified Baseline Methodology: ACM0002, “(Title: Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, Ver 21.0).

The project activity involves the generation of grid-connected electricity from renewable solar energy. The project activity has an installed capacity of 30 MW which qualifies for a large-scale project. The project status corresponds to the methodology ACM0002., version 21.

### Methodology key elements

<b>Typical project(s)</b>	Retrofit, rehabilitation (or refurbishment), replacement or capacity addition to an existing power plant or construction and operation of a new power plant/unit that uses renewable energy sources and supplies electricity to the grid. Battery energy storage system can be integrated under certain conditions
<b>Type of GHG emissions mitigation action.</b>	Renewable energy: Displacement of electricity that would be provided to the grid by more-GHG-intensive means.

### Applicability of methodologies and standardized baselines

The project activity involves the generation of grid-connected electricity from the construction and operation of a new solar power-based power project. The project activity has an installed capacity of 30 MW which will qualify for a large-scale project. The project status corresponds to the methodology ACM0002., version 21, and the applicability of the methodology is discussed below:

- ❖ This project is included within the UCR Standard Positive List of technologies and qualifies for the large-scale CDM thresholds (i.e., installed capacity above 15 MW). The positive list



comprises of the project being a greenfield plant /unit.

- ❖ Project activity involves installation of 30 MWh renewable electricity generation plant (solar farm) connected to the regional power grid.
- ❖ The project activity involves installation of Solar PV (SPV). Hence, the activity is not a Hydro power project or combined heat and power (co-generation) systems.
- ❖ Project is not an activity that involves switching from fossil fuels to renewable energy at the site of the project activity.
- ❖ The project activity is a new installation, it does not involve any retrofit measures nor any replacement.
- ❖ Landfill gas, waste gas, wastewater treatment and agro-industries projects are not relevant to the project activity. No biomass is involved, the project is only a solar power project.
- ❖ The technology/measure allowed under the grid connected Solar PV based generation systems displace equivalent quantity of electricity from the regional grid in India. The testing/certifications; all the equipment of the solar project activity will be complying with applicable national/ international standards. The above details may be verified from one or more of the following documents:
  - Technology Specification provided by the technology supplier.
  - Purchase order copies
  - EPC contracts
  - Project commissioning certificates, etc.
- ❖ The project activity is a voluntary coordinated action  
As per the Ministry of Environment and Forest (MoEF), Govt. of India Office Memorandum dated 13/05/2011, it had received specific clarification regarding the applicability of EIA Notification, 2006 in respect of Solar Photo Voltaic (PV) Power plants. It was further clarified in the above memorandum that both Solar PV power projects are not covered under the ambit of EIA Notification, 2006 and no environment clearance is required for such projects under provisions thereof.



- ❖ This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s). Hence this methodology is applicable and fulfilled for the solar project activity.
- ❖ The project activity involves installation of new power plants at listed sites where there was no renewable energy power plant operating prior to implementation of project.
- ❖ Project and leakage emissions from biomass are not applicable.

### **Applicability of double counting emission reductions**

There is no double accounting of emission reductions in the project activity due to the following reasons:

- The project is uniquely identifiable based on its location coordinates,
- The project has a dedicated commissioning certificate and connection point,
- Project is associated with energy meters which are dedicated to the consumption point for the project developer.

Agreement for Double Counting Avoidance from Proponent has been provided duly signed on 22.04.2024.

### **Project boundary, sources and greenhouse gases (GHGs)**

The project activity consists of the utilization of the solar radiation as input source of energy. This solar radiation is converted to direct current (DC) through Photovoltaic cell modules and further converted to alternate current (AC) through inverters and fed into the regional grid. There are no sources of gas generation or involvement of gas either as fuel or as exhaust.

As per applicable methodology ACM0002. version - 21, "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the project power plant is connected to."

Thus, the project boundary includes the Solar Power Plant and the Indian grid system.



	Source	GHG	Included?	Justification/Explanation
Baseline	Grid connected electricity.	CO <sub>2</sub>	<b>Included</b>	<b>Major source of emission</b>
		CH <sub>4</sub>	Excluded	Excluded for simplification. This is conservative.
		N <sub>2</sub> O	Excluded	Excluded for simplification. This is conservative.
Project Activity	Greenfield Solar Power Project	CO <sub>2</sub>	Excluded	Excluded for simplification. This is conservative.
		CH <sub>4</sub>	Excluded	Excluded for simplification. This is conservative.
		N <sub>2</sub> O	Excluded	Excluded for simplification. This is conservative.

### Project Emissions (PEy)

As per ACM0002. version - 21, only emissions associated with fossil fuel combustion, emissions from the operation of geothermal power plants due to the release of non-condensable gases, and emissions from a water reservoir of Hydro should be accounted for the project emission. Since

the project activity is a solar electric power project, it's emission from renewable energy plants is nil. Thus, **PE = 0**

### Leakage Emission

As per ACM0002. version - 21, 'If the energy generating equipment is transferred from another activity, leakage is to be considered.' In the project activity, there is no transfer of energy-generating equipment, and therefore the leakage from the project activity is considered zero.

Hence, **LE = 0**

### Establishment and description of baseline scenario (UCR Protocol)

As per the approved consolidated methodology ACM0002. version - 21, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

“The baseline scenario is that the electricity delivered to the grid by the project activity would





have otherwise, been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid”.

**Project Activity and Baseline:** The project activity involves setting up a new solar power plant to harness the green power from solar energy and utilize the generated electricity as a captive source for PP. In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel-fired plants. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

**Grid Emission Factor:** The term “grid emission factor” refers to the CO<sub>2</sub> emission factor (measured in tCO<sub>2</sub>/MWh) associated with each unit of electricity provided by an electricity system. For Indian projects not previously verified under any GHG program, the UCR recommends using a conservative estimate of 0.9 tCO<sub>2</sub>/MWh for the years 2013-2020. Additionally, for the vintage 2021-2022, the combined margin emission factor calculated from the CEA database in India indicates higher emissions than the default value. Consequently, the same emission factor has been applied to calculate emission reductions using a conservative approach.

Total Installed Capacity: 30 MW

Commissioning Date of first installation: 26/03/2016

### **Baseline Emission Reductions:**

Baseline emissions include only CO<sub>2</sub> emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

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

Where

$BE_y$  = Baseline emissions in year y (tCO<sub>2</sub>)

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

$EF_{grid,y}$  = UCR recommended emission factor of 0.9 tCO<sub>2</sub>/MWh has been considered.



Year	Net Export Units in KWh	Net Export Units in MWh
2016	3,73,90,000	37,390
2017	4,73,01,615	47,302
2018	5,57,04,000	55,704
2019	5,62,66,000	56,266
2020	5,21,72,000	52,172
2021	5,31,85,016	53,185
2022	5,38,56,403	53,856
2023	5,52,34,977	55,235
	<b>Total</b>	<b>4,11,110</b>

$$BE_y = 4,11,110 \text{ MWh} \times 0.9 \text{ tCO}_2/\text{MWh}$$

$$BE_y = 3,69,995 \text{ tCO}_2$$

Net GHG Emission Reductions and Removals

$$\text{Thus, } ER_y = BE_y - PE_y - LE_y$$

Where:

$ER_y$  = Emission reductions in year  $y$  ( $\text{tCO}_2/y$ )

$BE_y$  = Baseline Emissions in year  $y$  ( $\text{tCO}_2/y$ )

$PE_y$  = Project emissions in year  $y$  ( $\text{tCO}_2/y$ )

$LE_y$  = Leakage emissions in year  $y$  ( $\text{tCO}_2/y$ )

### Project Emissions

$$PE_y = 0$$

### Leakage Emissions

All projects other than Biomass projects have zero leakage.

$$\text{Hence, } LE_y = 0$$



**Issuance Period: 31/03/2016 to 31/12/2023 (07 years, 08 months)**

Total Emission Reduction (ER<sub>y</sub>) by the project activity for the current monitoring period is calculated as below:

$$\begin{aligned}ER_y &= BE_y - PE_y - LE_y \\ER_y &= 3,69,995 - 0 - 0 \\ER_y &= \mathbf{3,69,995}\end{aligned}$$

Year	2016	2017	2018	2019	2020	2021	2022	2023	Total
Emission Reduction ER <sub>y</sub> (tCO <sub>2</sub> )	33651	42571	50133	50639	46954	47866	48470	49711	<b>369995</b>

**Total Emission Reductions (ER<sub>y</sub>) = 3,69,995 CoUs (3,69,995 tCO<sub>2</sub>eq)**

### **Conclusions:**

Based on the audit conducted on the basis of UCR Protocol, which draws reference from UCR Protocol Standard Baseline & Emission Factor, UNFCCC Methodology Category ACM0002: Grid-connected electricity generation from renewable sources - Version 21.0, the audit conducted remotely by way of video calls / verification, phone calls and the documents verified and submitted during the verification including the Data, Project Concept Note (PCN) / Monitoring Report (MR), SQAC is able to certify that the emission reductions from the project - 30 MW Solar Power Project TKSP, Tamil Nadu, India, (UCR ID – 419) for the period **31/03/2016 to 31/12/2023** amounts to **3,69,995 CoUs (3,69,995 tCO<sub>2</sub>eq)**

\_\_\_\_\_  
Santosh Nair  
Lead Verifier  
(Signature)



\_\_\_\_\_  
Praful Shinganapurkar  
Senior Internal Reviewer  
(Signature)

Date: 22/04/2024