Verification Report for

Project : 0.27 MW Captive Solar Power Project ZIPL, Gujarat, India.

UCR Project ID : 415

Name of Verifier	SQAC Certification Pvt. Ltd.
Date of Issue	February 29, 2024
Project Proponent	M/s Zydus Infrastructure Pvt. Ltd. (ZIPL)
Work carried by	Mr. Santosh Nair
Work reviewed by	Mr. Praful Shinganapurkar

Summary:

SQAC Certification Pvt. Ltd. has performed verification of the "0.27 MW Captive Solar Power Project ZIPL, Gujarat, India." The purpose of the proposed project activity is to is to produce electricity through a sustainable and renewable energy source: solar radiation. Specifically, the project involves setting up and operating a 0.27 MW solar power plant in Sanand Taluka, located in the state of Gujarat.

The project activity meets the following UN SDG's:

Verification for the period**: 01/03/2019 to 31/12/2023** (04 years 09 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 AMS-I.F. Small-scale Methodology, Renewable electricity generation for captive use and mini-grid Ver 05. The verification was done remotely by way of video calls / verification, phone calls and submission of documents for verification through emails.

SQAC is able to certify that the emission reductions from the 0.27 MW Captive Solar Power Project ZIPL, Gujarat, (UCR ID – 415) for the period **01/03/2019 to 31/12/2023** amounts to **1,540 CoUs** (**1,540** tCO_2eq)

Detailed Verification Report:

Purpose:

This is a single project activity of total installed capacity 0.27 MW, which is a ground mounted captive solar power generation activity by M/s Zydus Infrastructure Pvt. Ltd. (ZIPL, Project Proponent or PP). PP has the full ownership of the project activity. The project activity of 0.27 MW is the installation and operation of a solar power plant in Pharmaceutical Special Economy Zone (SEZ) called "Pharmez", about 25 kilometers from Ahmedabad, Gujarat are per the details listed below:

Village	Taluka	Type	Total installed capacity in KW	Commissioning Date
Matoda	Sanand	Ground Mounted - Captive	270	20.01.2019

The purpose of the proposed project activity is to generate electricity for captive usage using a clean and renewable source of energy i.e., solar radiation. The project activity generated approximately 1713.8 MWh of renewable electricity over the entire monitored period.

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

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	01/03/2019
Carbon credits s (CoUs) claimed up to	31/12/2023
Total ERs generated in this crediting period (tCO_{2eq})	1,540 tCO_2eq (expressed as CoUs)
Project Emission	0
Leakage	0

As per the UNFCCC Methodology, eligible projects comprise of renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s).

The project activity displaces 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:

(a) A national or a regional grid (grid hereafter)

The baseline scenario identified as per the approved consolidated methodology AMS-I.F. Version 05 is:

The product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor.

Location of project activity:

Country	: India.
District	: Ahmedabad
Village	: Matoda
Taluka	: Sanand
State	: Gujarat
Pincode	: 382213
Latitude	: 22°52'51.6"N & 22°52'55.8"N
Longitude	: 72°24'24.5"E & 72°24'28.5"E
Project Commissioning Year	: 20.01.2019

The representative location map is included below:

Scope:

The scope covers verification of emission reductions from the project 0.27 MW Captive Solar Power Project ZIPL, Gujarat (UCR ID – 415)

Criteria:

Verification criteria is as per the requirements of UCR Standard.

Description of project:

The project activity is using clean renewable solar energy to produce electricity. The applied technology is considered to be one of the safest and sound environment friendly technologies. The purpose of the proposed project activity is to generate electricity for captive usage using a clean and renewable source of energy i.e., solar radiation. The generation of power from solar photovoltaic is a clean technology as there is no fossil fuel fired or no GHG gases are emitted during the process. Thus, project activity leads to reduce the GHG emissions as it displaces power from fossil fuel-based electricity generation in the regional grid.

Parameter	**Description**
Total number of Photovoltaic Modules	842
Rating of Photovoltaic Module	0.320 KWP- Kilo watt peak / 320 WP- watt peak
Technology	Poly Crystalline Silicon
Solar Panel Maker	Seraphim
Meter Maker	Secure
Commissioning Date	20.01.2019
Inverter Make	Solis
Total no. of inverters	06

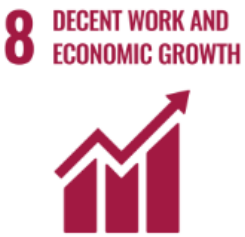
The project activity displaces electricity from an electricity distribution system that is supplied by at least one fossil fuel fired generating unit, i.e., in the absence of the project activity, the users would have been supplied electricity from: A national or a regional grid (grid hereafter).

United Nations Sustainable Development Goals:

The project activity generates electrical power using solar energy there by displacing non-renewable fossil resources resulting in sustainable, economic and environmental development. In the absence of the project activity equivalent amount of power generation would have taken place through fossil fuel dominated power generating stations.

Thus, the renewable energy generation from project activity will result in reduction of the 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)
 SDG 13: Climate Action	13.2: Integrate climate change measures into national policies, strategies and planning Target: **1540 tCO_2** avoided for the Monitored Period 01	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)
 SDG 7: Affordable and Clean Energy	7.2: By 2030, increase substantially the share of renewable energy in the global energy mix Target: **1713 MWh** renewable power supplied for the Monitored Period 01	7.2.1: Renewable energy share in the total final energy consumption
 SDG 8: Decent Work and Economic Growth	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 Target: Training, O&M staff	8.5.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities

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 Report
- Calibration reports
- Solar Panel layout
- Data provided upon request of all the documents of the related project.

Sampling:

Not applicable

Persons interviewed:

1. Mr. Kapil acharya : General Manager – Operations, M/s Zydus Infrastructure Pvt. Ltd.
2. Mr. Bhavesh Thaker: Manager, M/s Zydus Infrastructure Pvt. Ltd.

Solar Project Site Handover Certificate

This is to certify that, U R Energy India Pvt. Ltd has successfully installed Solar Plant having Capacity of 270 (269.44) kWp at Zydus Infrastructure Pvt. Ltd. with the Mentioned timeline, Scope of work, and Specified Make of appliances as per the Commercial Offer.

Site has been handed over to us and we are satisfied with the installation work.

For,
U R Energy India Pvt. Ltd

Customer Sign & Stamp
15/8/19

GEDA
ગુજરાત ઊર્જા વિકાસ એજન્સી
GUJARAT ENERGY DEVELOPMENT AGENCY
A Government of Gujarat Organisation

Ref: GEDA/SOL-23901/2018/07/OW/ 9464 Date: July 21, 2018

By REGISTERED A.D.

To,
Chief Engineer (OP),
Uttar Gujarat Vij Company Limited (UGVCL),
Visnagar Road, Mehsana
Mehsana – 384 001

Chief Electrical Inspector,
Block no. 18, 6th floor, Udyog Bhavan, Sector-11,
Gandhinagar- 382 017

Sub: Registration of application for setting up of Solar Ground Mounted Project under Gujarat Solar Power Policy -2015.
Ref: Application registration no.GMSPVIND21072018-23901 dated 21-Jul-18.

Sir,
With reference to above, the details of application received at GEDA are as under:

1. GEDA registration number is GMSPVIND21072018-23901 dated 21-Jul-18.
2. Contract Demand 600 kVA Consumer no.18415
3. The application for Solar Ground Mounted Project capacity is up to 215 kW (DC); as per the copy of electricity bill provided by the applicant which is up to 50% of the Contract Demand.
4. Documents regarding ownership/ legal possession of the premises are provided by the applicant.
5. You may consider providing grid connectivity as per the provision of the policy and also enter into wheeling of power agreement with the applicant. The Energy Settlement option is Billing Cycle as per the provision of the policy.
6. The specification of Bi-directional meter/ upgradation of present meter to Bi-directional meter for Net Metering as per the provision of policy be provided to the applicant.
7. Commissioning shall be taken up by GEDA on the submission of CEIG permission (CEIG Permission is required if the Project Capacity is greater than 10 kW) along with connectivity and wheeling agreement with DISCOM.
8. The action taken in the matter for the above applicant may be intimated to GEDA for further consideration. Future correspondence may be referred with GEDA Application registration number.

Thanking you,

Yours faithfully
(S. B. PATIL)
DY DIRECTOR

Cc to: (1)M/s.Zydus Infrastucture Pvt. Ltd.
Zydus Tower, Satellite Cross Road
Matoda, Ta- Sanand
Dist-Ahmedabad- 382213
(2)M/S.U R Energy (India) Pvt. Ltd.

You may install the Solar PV System on execution of Connectivity agreement with DISCOM.

બીજો માળ, બ્લોક નં. ૧૧ થી ૧૨ ઉદ્યોગભવન
સેક્ટર-૧૧, ગાંધીનગર - ૩૮૨ ૦૧૭.
4th Floor, Block No. 11-12, Udhyogbhavan,
Sector-11, Gandhinagar-382017. India.
Ph. : 079-232 5725 I-53
Fax : +91 79 232-47097, 57255
e-mail : director@geda.org.in
www.geda.gujarat.gov.in

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Energy for All

UR Energy (India) Pvt. Ltd.
Part of V Square Group
CIN :U40108GJ2011PTC067834

Our Ref./URE/2019-20/423

Date : 08/05/2019

To,
Mr. Kailash Bahuguna
Zydus Infrastructure Pvt. Ltd,
Zydus Tower, Satellite Cross Road Matoda, Ta – Sanand
Dist.-Ahmedabad - 382213.

Subject: Regarding Handover of 269.44 KWp Rooftop Solar Power Project and subsequent related documentation at Zydus Infrastructure Pvt. Ltd, At Sarkhej - Bhavla Road, NH 8A , Matoda, Sari, Gujarat 382220.

Dear Sir,

Season Greetings from U R Energy...!!!!

Reference to the above, we hereby would like to inform with great pleasure that we have commissioned the 269.44 KWp Rooftop Solar Power Project and subsequent related documentation at Zydus Infrastructure Pvt. Ltd, At Sarkhej - Bhavla Road, NH 8A, Matoda, Sari, Gujarat 382220 as on date 08/05/2019. The work has come up very well and validation of the project has been well within the guide lines prescribed as you might have observed.

We would like to take this opportunity to thank you upfront for your kind support during the project duration and your valuable suggestions had indeed helped us to gain the shape of the project.

We hereby would like to handover the facility to you through this formal letter.

Request your kind acknowledgement of this letter to proceed with further documentation and reference.

Enclosed Documents for your kind reference:

1. Installation & Commissioning Report.
2. Operation & Maintenance Schedule.
3. GEDA Application & Registration Letter.
4. Data sheet of Inverter & Solar PV Module.
5. CEIG Drawing Approval Letter.
6. Payment receipt of testing charges of bidirectional & solar energy meter.
7. CEIG Charging Certificate (NOC).
8. UGVCL's Bidirectional & Solar Energy Meter installation sheet.

Thanking You,
For, U R Energy (India) Pvt Ltd

Authorized Signatory

Office Address :
B-1, 901-906, 9th Floor, Palladium, B/h. Divya Bhaskar Press,
Corporate Road, Makarba, Ahmedabad-380015, Gujarat, India.
Phone : +91-79-26935400/01/02/03
india@urenergyglobal.com | www.urenergyglobal.com | Toll Free No. 1800 120 4011

HI-TECH METER LABORATORY
Near Torrent Power railway crossing, Sabarmati, Ahmedabad-380 005
PHONE: (079) 27506435, E-MAIL: hitechlab@ugvcl.com

TC-5914

UGVCL

TEST REPORT
Test Report No: HML/T/23-09/8358 Issue Date: 08/09/2023 Page 1 of 2
ULR – TC591423000001247F
Discipline: Electrical Group: Electrical Indicating & Recording Instruments

NAME & CONTACT INFORMATION OF CUSTOMER:

To,
M/s. Zydus Infrastructure Pvt Ltd.
Pharmez, N.H. – 8A,
Sarkhej – Bavla Road,
Vi. Matoda,
Ta. Sanand,
Dist. Ahmedabad – 382213.

Reference SRF No: 8358/2023[T]	Date of receipt: 06/09/2023	Date of testing: 08/09/2023

Consumer Reference:

TEST ITEM DESCRIPTION & IDENTIFICATION: 3P4W Bidirectional Energy Meter (KWh Meter)

Voltage	11KV/110V, Vref- 3*63.5V	Current	-/5A, Ib=5A, Imax=10A
Applicable Standard	IS 14697	Condition of sample	GOOD

Sr.	Meter Sr. No:	Job No:	Make	Type	Mfg. Year:	Imp/Kwh	Class:	Current
1	GHBD1348	HML/T/8358/23-09-01	SCHNEIDER	ER300P	APR 2023	100	0.5s	-/5A, Ib=5A, Imax=10A
2	GHBD1356	HML/T/8358/23-09-02	SCHNEIDER	ER300P	APR 2023	100	0.5s	-/5A, Ib=5A, Imax=10A

Test Details: As mentioned in page no 2, Results: As per enclosed pages,
Temperature: 27°C±2°C,**Relative Humidity:** between 45 % to 75%
Test methods used: As Per IS 14697
Addition or deviation from method used: No, **Results from external provider:** Not applicable.
Test witnessed by:

Major Equipments used for testing:

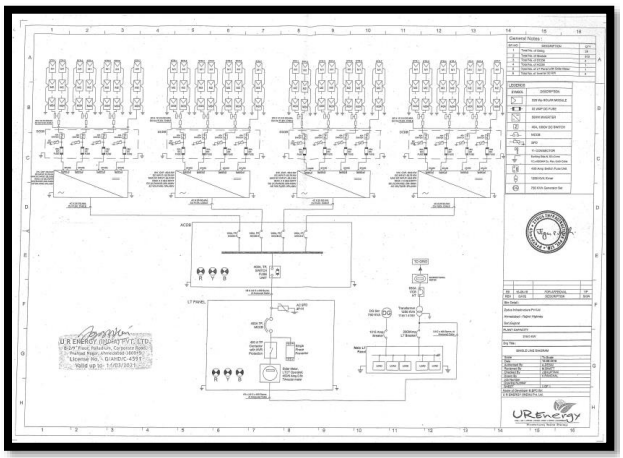
Sr. No.	Description	Make/ Model	Sr. no.	Range of Measurement	Measurement Uncertainty
1	Reference Standard Meter	Applied Precision	1207020594	Voltage –3x40 to 300VAC(P-N) Current 3x10 mA..120A(cl.0.02)	CMC FOR ENERGY: ±0.028 to ±0.055

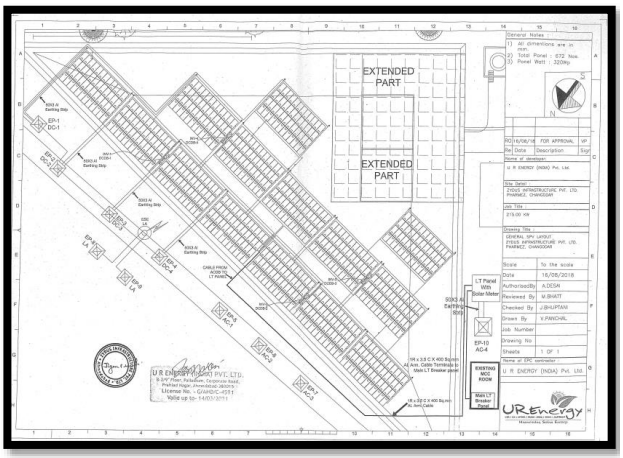
NOTE:
1. This report relates only to the particular sample received in good condition for testing at Hi-Tech Meter Laboratory, UGVCL, Sabarmati.
2. The results mentioned are in % error with respect to unit of measurement.
3. This report cannot be reproduced in part under any circumstances.
4. Publication of this report requires prior permission in writing from at Hi-Tech Meter Laboratory, Sabarmati.
5. All the tests within the scope of Hi-Tech Meter Laboratory are carried out.
6. The decision rule applied as per contract with customer.
7. The test item details are provided by the customer and on the name plate of test item.
8. Sample provided by customer, no sampling done at Hi-Tech Meter Laboratory, Sabarmati
9. Any Anomaly/discrepancy in this report should be brought to our notice within 45days from issue of this report.

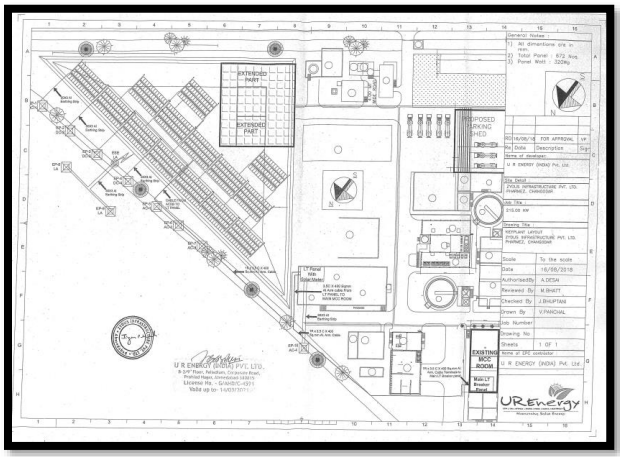
PREPARED BY
S K KARAMATA
DEPUTY QUALITY MANAGER

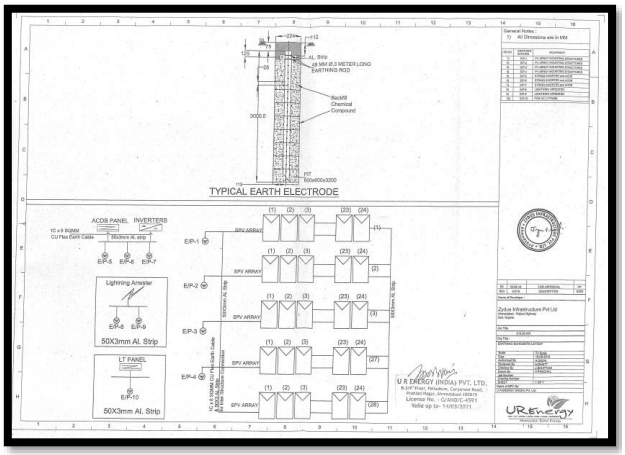
HI-TECH METER LABORATORY UGVCL SABARMATI, AHMEDABAD

REVIEWED, APPROVED & AUTHORIZED BY
A N DIWAN
TECHNICAL MANAGER







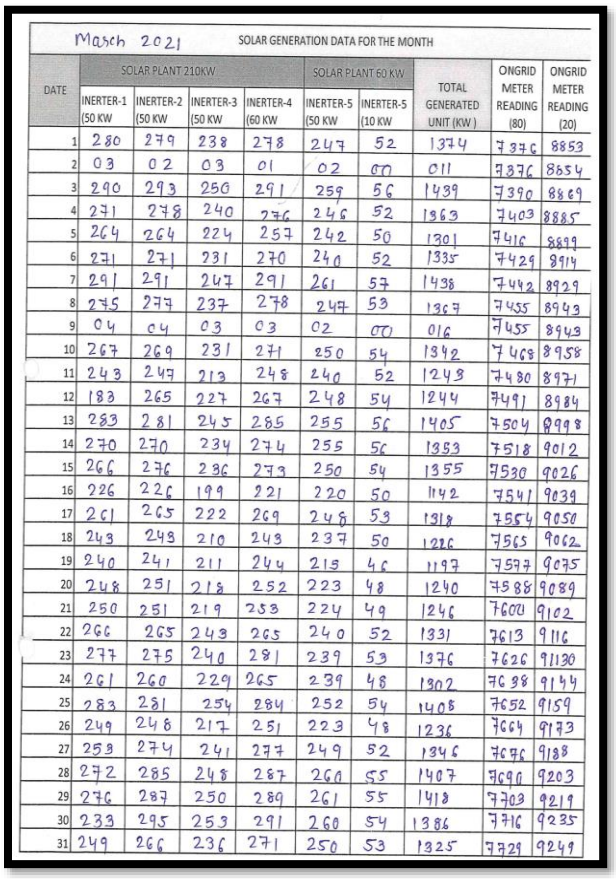


Solar Generation data for the month June 2019

Date	SOLAR PLANT 210 KW				SOLAR PLANT 60 KW		Total Generated Unit (KW)	210 KW ongrid Meter reading (80)	60 KW ongrid Meter reading (40)
	Inverter -1 (50KW)	Inverter -2 (50KW)	Inverter -3 (50 KW)	Inverter -4 (50 KW)	Inverter -5 (50 KW)	Inverter -6 (10 KW)			
1	85	85	82	93	258	57	660	5.74	17.25
2	243	241	235	268	235	51	1273	12.34	14.3
3	269	266	254	293	258	56	1396	13.52	15.7
4	78	72	75	88	82	16	411	3.91	4.9
5	259	260	250	285	265	56	1375	13.17	16.05
6	245	249	240	271	256	54	1315	12.67	15.5
7	243	248	236	269	251	55	1302	12.45	15.3
8	247	252	244	278	257	54	1332	12.76	15.55
9	275	270	256	288	255	54	1398		15.45
10	271	267	245	277	236	51	1347		14.35
11	262	260	237	269	242	54	1324		14.8
12	230	230	207	236	270	51	1164		13.05
13	211	210	189	216	193	41	1060		11.7
14	231	233	208	238	223	49	1182		13.6
15	186.3	188.8	170.0	192.7	177	31	944		10.4
16	228	229	210	238	217	46	1188		13.15
17	242	236	220	250	227	48	1223		13.75
18	24	248	23	25	023	13	1322		1.8
19	185	184	119	189	171	37	885		
20	231	228	209	239	213	45	1165		
21	224	221	203	232	210	45	946		
22	232	230	212	241	214	48	1177		
23	255	253	232	265	234	50	1289		
24	1.9	1.9	1.8	2.0	001.8	—	09		
25	244	244	221	252	227	48	1236		
26	229	225	209	237	215	47	1163		
27	198	198	181	206	186	40	1009		
28	125	124	113	128	117	25	632		
29	156	154	141	160	145	32	759		
30	186	184	169	191	170	40	940		
31									
Total			5531						

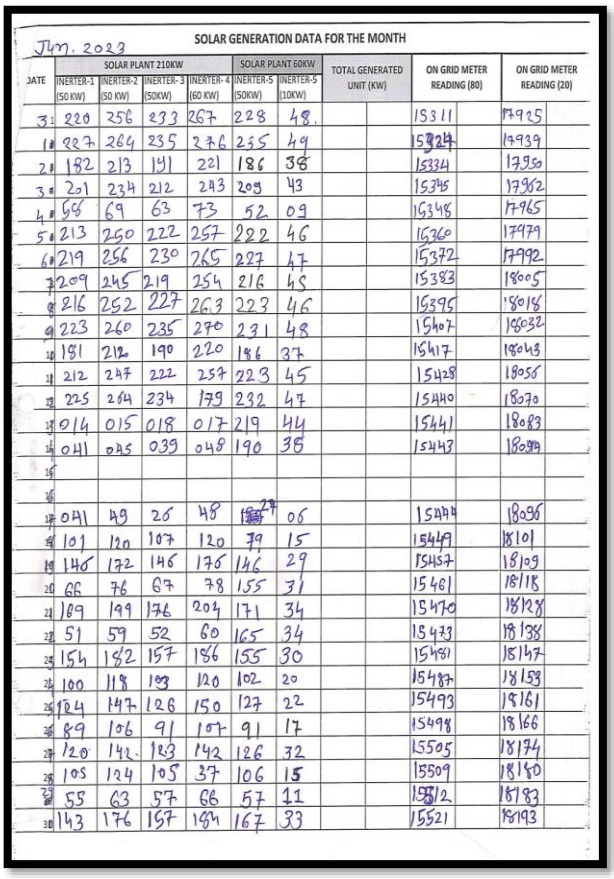
Solar Generation data for the month April 019

Date	SOLAR PLANT 210 KW				SOLAR PLANT 60 KW		Total Generated Unit (KW)	210 KW ongrid Meter reading (80)	60 KW ongrid Meter reading (40)
	Inverter -1 (50KW)	Inverter -2 (50KW)	Inverter -3 (50 KW)	Inverter -4 (50 KW)	Inverter -5 (50 KW)	Inverter -6 (10 KW)			
1	256	282	241	279	252	54	1310	16.375	15.3
2	269	300	264	301	264	66	1464	14.17	16.5
3	277	300	262	306	257	56	1458	14.31	15.65
4	234	236	204	240	201	43	1159	11.42	12.25
5	291	293	256	296	270	58	1463	14.18	16.4
6	299	301	269	309	280	58	1516	14.72	16.9
7	290	292	264	309	271	58	1484	14.4	16.45
8	298	298	256	301	279	60	1492	14.41	16.95
9	297	305	273	319	280	60	1534	14.92	17
10	301	306	270	312	285	60	1534	14.86	17.25
11	294	300	269	314	284	60	1521	14.71	17.2
12	289	295	263	305	279	59	1496	14.4	16.9
13	281	287	256	300	272	59	1455	14.05	16.55
14	249	256	230	267	245	53	1300	12.52	14.9
15	211	218	200	230	210	46	1115	10.74	12.8
16	155	101	151	141	156.5	33.9	638	7.97	9.45
17	299	300	266	309	276	57	1174	14.63	16.7
18	308	300	274	319	289	60	1201	15.01	17.45
19	304	307	274	320	290	61	1556	15.06	17.55
20	293	298	266	309	279	59	1504	14.57	16.9
21	295	302	268	311	284	61	1521	14.7	17.2
22	124	124	109	130	290	61	838	6.08	17.55
23	258	259	230	267	282	60	1355	12.67	17.1
24	297	297	267	310	280	60	1511	14.63	17.00
25	276	278	250	289	261	57	1411	13.66	15.9
26	275	281	250	292	266	58	1422	13.72	16.2
27	288	291	264	306	282	60	1491	14.36	17.1
28	292	295	269	312	287	60	1515	14.6	
29	285	299	277	299	281	61	1482		
30	290	285	292	292	282	61	1502		
31	287	294	285	306	288	60	1520		
Total			7777				42939 x 7		= 300573



March 2021 SOLAR GENERATION DATA FOR THE MONTH

DATE	SOLAR PLANT 210KW				SOLAR PLANT 60 KW		TOTAL GENERATED UNIT (KW)	ONGRID METER READING (80)	ONGRID METER READING (20)
	INERTER-1 (50 KW	INERTER-2 (50 KW	INERTER-3 (50 KW	INERTER-4 (60 KW	INERTER-5 (50 KW	INERTER-5 (10 KW			
1	280	279	238	278	247	52	1374	7376	8853
2	03	02	03	01	02	00	011	7376	8854
3	290	293	250	291	259	56	1439	7390	8869
4	271	278	240	276	246	52	1363	7403	8885
5	264	264	224	257	242	50	1301	7416	8899
6	271	271	231	270	240	52	1335	7429	8914
7	291	291	247	291	261	57	1438	7442	8929
8	275	277	237	278	247	53	1367	7455	8943
9	04	04	03	03	02	00	016	7455	8943
10	267	269	231	271	250	54	1342	7468	8958
11	243	247	213	248	240	52	1243	7480	8971
12	183	265	227	267	248	54	1244	7491	8984
13	283	281	245	285	255	56	1405	7504	8998
14	270	270	234	274	255	56	1353	7518	9012
15	266	276	236	273	250	54	1355	7530	9026
16	226	226	199	221	220	50	1142	7541	9039
17	261	265	222	269	248	53	1318	7554	9050
18	243	243	210	243	237	50	1226	7565	9062
19	240	241	211	244	215	46	1197	7577	9075
20	248	251	218	252	223	48	1240	7588	9089
21	250	251	219	253	224	49	1246	7601	9102
22	266	265	243	265	240	52	1331	7613	9116
23	277	275	240	281	239	53	1376	7626	91130
24	261	260	229	265	239	48	1302	7638	9144
25	283	281	254	284	252	54	1408	7652	9159
26	249	248	217	251	223	48	1236	7664	9173
27	253	274	241	277	249	52	1346	7676	9188
28	272	285	248	287	260	55	1407	7690	9203
29	276	287	250	289	261	55	1418	7703	9219
30	233	295	253	291	260	54	1386	7716	9235
31	249	266	236	271	250	53	1325	7729	9249



Jun. 2023 SOLAR GENERATION DATA FOR THE MONTH

DATE	SOLAR PLANT 210KW				SOLAR PLANT 60KW		TOTAL GENERATED UNIT (KW)	ON GRID METER READING (80)	ON GRID METER READING (20)
	INERTER-1 (50 KW)	INERTER-2 (50 KW)	INERTER-3 (50KW)	INERTER-4 (60 KW)	INERTER-5 (50KW)	INERTER-5 (10KW)			
3	220	256	233	267	228	48		15311	17925
1	227	264	235	276	255	49		15324	17939
2	182	213	191	221	186	38		15334	17950
3	201	234	212	243	209	43		15345	17962
4	58	69	63	73	52	09		15348	17965
5	213	250	222	257	222	46		15360	17979
6	219	256	230	265	227	47		15372	17992
7	209	245	219	254	216	45		15383	18005
8	216	252	227	263	223	46		15395	18018
9	223	260	235	270	231	48		15407	18032
10	181	212	190	220	186	37		15417	18043
11	212	247	222	257	223	45		15428	18056
12	225	264	234	179	232	47		15440	18070
13	014	015	018	017	219	44		15441	18083
14	041	045	039	048	190	38		15443	18089
15									
16									
17	041	49	26	48	184	06		15444	18096
18	101	120	107	120	79	15		15449	18101
19	146	172	146	176	146	29		15457	18109
20	66	76	67	78	155	31		15461	18118
21	189	199	176	209	171	34		15470	18128
22	51	59	52	60	165	34		15473	18138
23	154	182	157	186	155	30		15481	18147
24	100	118	103	120	102	20		15487	18159
25	124	147	126	150	127	22		15493	18161
26	89	106	91	107	91	17		15498	18166
27	120	142	123	142	126	32		15505	18174
28	105	124	105	37	106	15		15509	18180
29	55	63	57	66	57	11		15512	18183
30	143	176	157	154	167	33		15521	18193

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: AMS-I.F. – Renewable electricity generation for captive use and mini-grid, ver 05.

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:

(a) A national or a regional grid (grid hereafter)

Methodology key elements

Typical project(s)	Production of electricity using renewable energy technologies such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s).
Type of GHG emissions mitigation action.	Renewable energy: displacement of electricity that would be provided to the user(s) by more-GHG-intensive means.

Applicability of methodologies and standardized baselines

The project status is corresponding to the methodology AMS-I.F., version 05 and applicability of methodology is discussed below:

Table 2. Applicability of AMS-I.D, AMS-I.F and AMS-I.A based on project types

	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[5] 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	√		

- This project is included within the UCR Standard Positive List of technologies and are within the small-scale CDM thresholds (e.g., installed capacity up to 15 MW). The positive list comprises of: (a) renewable electricity generation technologies of installed capacity up to 15 MW, (b) Solar technologies (photovoltaic and solar thermal electricity generation);
- Project activity involves installation of captive use solar photovoltaic power generation with capacity 0.27 MW which is less than 15MW.

- 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 displaces grid electricity consumption (e.g., grid import).
- 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

Renewable electricity units are meticulously monitored through digital means, utilizing distinct energy meters positioned within the project activity boundary. It's essential to note that the project activity will not participate in India's NDC carbon ecosystem/market and has not been enlisted under any other GHG mechanism for carbon offsets/credits previously.

Agreement for Double Counting Avoidance from Proponent has been provided duly signed on 26.02.2024.

Project boundary, sources and greenhouse gases (GHGs)

The spatial extent of the project boundary includes industrial, commercial facilities consuming energy generated by the system and encompasses the physical, geographical site of the solar power plant and the energy metering equipment.

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 as per the requirements provided in TOOL07 to which the project power plant is connected.

	Source	GHG	Included?	Justification/Explanation
Baseline	Grid connected electricity.	**CO_2**	**Included**	**Major source of emission**
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
Project Activity	Greenfield Solar Power Project	CO_2	Excluded	Excluded for simplification. This is conservative.
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.

According to AMS-I.F, Project Emissions (PEy) for the following categories of project activities, including relevant definitions, shall be considered following the procedure described in the ACM0002:

- Emissions related to the operation of geothermal power plants (e.g., non-condensable gases, electricity/fossil fuel consumption);
- Emissions from water reservoirs of hydro power plants.
- For the other types of renewable energy projects, $PE_y = 0$

Hence PEy = 0 since the project is a solar power project.

LE_y = Leakage emissions in year y (tCO_2/y)

Year / Month / KWh	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	0	0	37184	42939	42738	31186	22500	23379	25034	36162	28529	25882
2020	30908	32929	39300	39360	38020	31640	31280	21300	32300	32000	28200	27300
2021	28940	29160	36160	38040	35000	27860	23680	24040	19140	31680	25300	23420
2022	28820	31740	36760	37280	28020	26100	21380	24380	25040	32320	28280	27440
2023	27460	30820	31920	33180	35880	22160	21840	23540	27860	28260	24400	16420

Establishment and description of baseline scenario (UCR Protocol)

The baseline scenario is the product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor.

Total Installed Capacity: 0.27 MW

Commissioning Date of first installation: 20.01.2019

Baseline Emissions

Baseline emissions include only CO_2 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.

Annual Emission Reductions: $\mathbf{BE_y = EG_{BL,yl} \times EF_{CO2,GRID,y}}$

Where:

BE_y = Emission reductions in year y (tCO_2)
$EG_{PJ,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the UCR project activity in year y (MWh)

$EF_{Grid,CO2,y}$ = CO_2 emission factor of the grid in year y (t CO_2/MWh) as determined by the UCR Standard.

$EF_{y,grid}$ = UCR recommended conservative Indian grid emission factor of 0.9 tCO_2/MWh has been considered, this is conservative as compared to the current combined margin Indian grid emission factor of 0.9185 tCO_2/MWh (assuming 50% equal distribution between OM and BM) which can be derived from Database of Central Electricity Authority (CEA), India. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4), and higher still if considered as an intermittent form of energy. Hence, the same emission factor has been considered to calculate the emission reduction.

For the other types of renewable energy projects, such as solar energy, PEy = 0

Net GHG Emission Reductions and Removals

Thus, ERy = BEy – PEy – LEy

Where:

ERy = Emission reductions in year y (tCO_2/y)

BEy = Baseline Emissions in year y (t CO_2/y)

PEy = Project emissions in year y (tCO_2/y)

LEy = Leakage emissions in year y (tCO_2/y)

Project Emissions

PE_y = 0

Leakage Emissions
All projects other than Biomass projects have zero leakage.

Hence, LE_y = 0

Issuance Period: (04 years, 09 months) **01/03/2019 to 31/12/2023**

Total Emission Reduction (ER) by the project activity for the current monitoring period is calculated as below:

Year	KWh	MWh	ER (tCO_2)
2019	315533	315.533	283
2020	384537	384.537	346
2021	342420	342.42	308
2022	347560	347.56	312
2023	323740	323.74	291
Total		**1713.79**	**1540**

Total Emission Reductions (ER_y) = **1,540 CoUs (1,540 tCO_2eq)**

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 AMS-I.F. Small-scale Methodology, Renewable electricity generation for captive use and mini-grid Ver 05, the audit conducted onsite by way of site visit, interviews, document verification and submission through emails 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 - 0.27 MW Captive Solar Power Project ZIPL, Gujarat, (UCR ID – 415) for the period **01/03/2019 to 31/12/2023** amounts to 1**,540 CoUs (1,540 tCO_2eq)**

SQAC Certification Pvt. Ltd. Mapusa-Goa.

Santosh Nair
Lead Verifier
(Signature)

Praful Shinganapurkar
Senior Internal Reviewer
(Signature)

Date: 29/02/2024