Energising India Using Solar Energy Projects

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Summary:

The project activity by Azure Power India Pvt ltd through various SPVs involves the generation of electricity through solar photovoltaic plant with a combined capacity of 480 MW in the state of Uttar Pradesh, Telangana, Andhra Pradesh and Gujarat India. This is an greenfield project activity and supply the generated electricity to the National power grid i.e. Indian Grid. Thus, project activity has reduced the dependence on fossil fuel-powered power plants by substituting carbon-intensive energy with the clean renewable solar energy. As per the baseline scenario, "Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants that are fossil fuel fired power plants". The baseline scenario is the same as the scenario existing prior to the implementation of the project activity.

During the Current Monitoring Period from 01-July-2019 to 29-February-2020 (First and last date included) the project activity has supplied 526,908.90 MWh of electricity, and thus contributing to the GHG reductions 493,604 tCO_2e.

Azure Power India Pvt Ltd contracted **ESPL** to conduct the verification of the project. The scope of verification includes confirming the implementation of the monitoring plan in the registered VCS PD (Ver. 03 dated 17-Sept-2019) and the application of methodology ACM0002: Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, Version 19.0.

The verification consisted of three phases: a. Desk review of the project; b. Follow-up remote audit ; c. Resolution of outstanding issues and issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted following ESPL's internal quality procedures.

A risk-based approach has been followed to perform this verification activity and No uncertainties associated with the verification. A total of 00 CL and 08 CARs have been raised during the verification process of the project activity which were successfully closed.

- ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements.

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1 INTRODUCTION

1.1 Objective

"Azure Power India Pvt Ltd" has contracted ESPL (Hereinafter referred as Earthood) to conduct the verification of the project activity "Energising India using Solar Energy Projects" according to the requirements of the Verified Carbon Standard version 4.0.

The objective of this verification is to verify and certify emission reductions reported for the PA" Energising India using Solar Energy Projects" for the period 01-July-2019 to 29-February-2020 (including both days).

1.2 Scope and Criteria

The scope of the verification is to establish/verify that:

- the appropriate VCS-MR form (and other templates) was used and correctly filled up; (as per https://verra.org/wp-content/uploads/2019/09/VCS-V4-Summary-of-Effective-Dates.pdf the use of updated version of all VCS Program templates and representations is mandatory from 19 March 2020)
- The project activity is in accordance with all relevant host country criteria (India);
- The project activity is in accordance with all relevant VCS rules and requirements;
- The project activity is in accordance with conditions of the latest version of applied methodology ACM0002: Large Consolidated methodology- Version 19.0/7/.

The verification of the project activity is based on the VCS-PD and estimated GHG emission reduction calculations.

1.3 Level of Assurance

☒ Reasonable level of assurance

☐ Limited level of assurance

ESPL's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considers necessary to give reasonable assurance that reported estimated GHG emission reductions are fairly stated. All documentary evidences were checked, and remote audit was conducted to arrive at a verification conclusion by the assessment team.

In our opinion, the estimated GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM 0002, version 19.0 and the VCS standard, Ver4.0.

1.4 Summary Description of the Project

The project activity by Azure Power India Pvt Ltd through various SPVs involves the generation of electricity through solar photovoltaic plant with a combined capacity of 480 MW in the state of Uttar Pradesh, Telangana, Andhra Pradesh and Gujarat India. This is a greenfield project activity and supply the generated electricity to the National power grid i.e. Indian Grid. The current monitoring period from 01-July-2019 to 29-February-2020 (First and last date included) and involved the generation and supply of 526,908.90 MWh solar power in Uttar Pradesh, Telangana, Andhra Pradesh and Gujarat. The power generated by the grid will be replacing an equivalent amount of electricity from the grid system of India which is majorly dependent on fossil-fuel based grid imports for its electricity requirements.

The project is a voluntary action being undertaken by each project owner of the project activity. EKI Energy Services Limited (hereafter referred as "EKIESL") is acting as the other entity for this project activity.

Verification team confirmed the capacity by verifying commissioning certificates/10/ and also verified through interview during remote audit that plants are operational in all the locations (Uttar Pradesh, Telangana, Andhra Pradesh and Gujarat). The details of interconnection with grid of solar plants and commissioning details are given in Section 4.1 of this report.

The technical specifications of solar plants confirmed with technical specifications from technology supplier and details as confirmed on skype during remote audit provided in Sec. 4.1 of this report.

These are the SPVs of Azure Power India Pvt Ltd and the projects are promoted by each SPV. The electricity meters are of a precision of 0.2s. The details of meters such as make, Sr, No., calibration frequency etc. are provided in Appendix 1 of this report. The project is based on sectoral Scope 1: Energy Industries (renewable sources) with ACM0002: Large-scale Consolidated methodology: Grid-connected electricity generation from renewable sources, Version 19.0.

During the Current Monitoring Period from 01-July-2019 to 29-February-2020 (First and last date included) the project activity has supplied 526,908,90 MWh of electricity, and thus contributing to the GHG reductions 493,604 tCO2e.

2 VERIFICATION PROCESS

The registered VCS project is undergoing second verification and the approach adopted to ensure the quality of emission reductions is described in the following sub-sections.

2.1 Method and Criteria

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using ESPL's internal procedures. The Project was verified against the latest requirements (Version 4.0) /14/ and guidance set out in VCS Standards as applicable.

- The verification process consists of the following three phases;
- A document review of the VCS PD and VCS MR (described in Section 2.2)
- Remote audit and follow up interviews with project stakeholders (described in Section 2.3 and 2.4)
- The resolution of outstanding issues and issuance of the final report and opinion. (described in Section 2.5)

DOE's Sampling Approach: No sampling approach was required for undertaking the current verification since all monitored data was verified by the assessment team.

2.2 Document Review

The verification is performed primarily as a document review of the documents submitted at various stages of assessments. The review is performed by assessment team using dedicated protocols. The assessment team cross checks the information provided in the documents (PDD, MR, validation report) and information from sources other than those used, if available, and also conducts independent background investigations. Earthood conducted a desk review as under;

a) A review of the data and information presented to verify their completeness.

b) A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.

c) An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.3 Interviews

A remote audit was conducted on 28-May-2020 through Skype video call which covers all the sites (includes all the locations) in the state of Uttar Pradesh, Telangana, Andhra Pradesh & Gujarat in India. No sampling procedures were adopted either in document verification and all the documents were cross checked to ensure conservative estimation of emission reduction. Remote audit conducted due to pandemic situation and technical details and metering/monitoring arrangement verified through photos/certificates shared by PP. The names of the persons interviewed during remote audit through Skype/telephonic interview/9/ is given below;

Name of SPVs	Location	Name of Persons/Designation	Topics discussed	Team Member
Azure Power Jupiter Pvt Ltd.	Hardoi	Himanshu Tiwari (PP Representative)	Project Implementation, Monitoring practices, Calibration requirements, GHG calculations, MR and ER preparation	Dr. Atul Takarkhede
	Hamirpur	Tariq Khan (PP representative)		
Azure Power Venus Pvt Ltd	Jalaun	Himanshu Wadhwani (PP representative	Project Implementation, Monitoring practices, Calibration requirements, GHG calculations, MR and ER preparation	
Azure Power Thirty Seven Pvt Ltd	Telangana	SAMBA SHIVA SATE HEAD)	Operation and Maintenance of Facility, Monitoring practices, Data collection, data storage, QA/QC	
Azure Power Thirty Six Pvt Ltd	Andhra Pradesh	Mr. Hari Kristen Galivedu	Operation and Maintenance of Facility, Monitoring practices, Data collection, data storage, QA/QC	
Azure Power Thirty Three Pvt Ltd	Vadol Gujarat	Manish prajapati Nimesh prajapati (PP representative)	Operation and Maintenance of Facility, Monitoring practices, Data collection, data storage, QA/QC	
EKI Energy Services Limited	Indore, Madhya Pradesh	Barun Sharma Prakash Kumar Sahu Consultant	GHG calculations, MR and ER preparation	

2.4 Site Inspections

Duration of on-site inspection: NA				
No.	Activity performed on-site	Site location	Date	Team member
1.	NA	NA	NA	NA

The verification team could not perform on-site inspection due to the ongoing COVID-19 pandemic in the entire state of India. Ministry of Home Affairs (MHA), Government of India has order nationwide lockdown from 25-March-2020 to 14-April-2020/22/. Further extended to 03-May-2020/23/ and again extended up 17-May-2020/24/. MHA again extended lock down up to 31/05/2020/25/. All domestic & International travel, passenger movement by trains, interstate buses for public transport, movement by individuals were prohibited/25/. The project sites and substation were not accessible in these locations due to lockdown. Further access to project site and sub-station was restricted and video call was not possible from sub-station.

Moreover, the VCS program does not explicitly mandate site visits as part of the validation and verification process during such unprecedented circumstances, only that VVBs must achieve a reasonable level of assurance on all validations and verifications (per section 4.1.2 of the VCS Standard, v4.0

The DOE reached reasonable level of assurance through remote verification via Skype/Telephonic interview (refer section 2.3) with the representative PP. through review of documentation/evidences such as technical layout, metering arrangements/specification of solar power Plants, logbook/26//monthly generation data/ photographs/20/ and name plates of solar power plants, calibration certificates of meters, validation and verification report/21/ of various issuance.

A remote audit was conducted by the assessment team (Dr. Atul Takarkhede) on 28 -May-2020 to carry out the following;

a. An assessment of the implementation and operation of the registered project activity as per the registered PD or any approved revised PD/1/ and MR/2/;
b. A review of information flow for generating, aggregating and reporting the monitoring parameters;
c. Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PD;
d. A cross-check between information provided in the monitoring report and data from other sources such as JMR sheets, invoice slips, PPA agreement etc.;
e. A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PD/1/, the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline;
f. A review of calculations and assumptions made in determining the GHG data and emission reductions;
g. An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

The findings may be of the following types: CAR- Corrective Action Request, CL- Clarification Request and FAR- Forward Action Request.

The list of findings and their resolution are presented in Appendix 2 of this verification report. The section also includes the response, if provided, by the project participants and an assessment by the assessment team if it was closed or otherwise. It is to be noted that all the findings have been satisfactorily resolved by the assessment team.

A total of 08 CAR and 00 CL were raised in the current verification. All the findings that are raised and communicated to project participant during the verification are included under Appendix 2. The section also includes the response, if provided, by the project participants and an assessment by the verification team if it was closed out or otherwise

2.5.1 Forward Action Requests

This is 2nd periodic verification of the project activity and no FAR is raised during current verification and no FAR from previous validation/verification as well.

2.6 Eligibility for Validation Activities

As project is already validated and this is 2nd verification of the project. Hence, this section not applicable.

3 VALIDATION FINDINGS

As project is already validated and this is 2nd verification of the project. Hence, this section not applicable

3.1 Participation under Other GHG Programs

PP has submitted an undertaking regarding no participation in any other GHG mechanism. VVB raised CAR 04 related to this which was closed successfully during verification. Hence, VVB confirms that PP is not participating in any other GHG mechanism during current monitoring period. Furthermore, VVB has checked the web site of other program like UNFCCC, VERRA & REC Registry of India and confirms that the project with same SPV, installed capacity and locations are not listed

3.2 Methodology Deviations

No methodology deviation is envisaged for present verification.

3.3 Project Description Deviations

PP has applied a deviation for monitoring of quantity of net electricity generation supplied by the 50 MW of SPV "Azure Power Thirty-Six Pvt Ltd" located in Andhra Pradesh. The monitoring of net electricity supplied to grid by this SPV is changed from November 2018 and now it is based on Settlement Mechanism (DSM). In DSM, PP provides forested energy generation (scheduled) in day time block (15 minutes each, total 96 blocks) in advance to the Sothern Regional Power Committee and invoicing are being done based on forecasted energy generation. Any deviation from forecasted generation is penalised which depends on magnitude of deviation.

The total schedule energy generation and the actual electricity supplied by the project activity is maintained by the Southern Regional Power Committee (SRPC) Secretariat, Central Electricity Authority, Government of India/6/. The actual electricity supplied is the net electricity supplied by the project to the grid. Regional Energy Account (monthly net export) for every month in respect of Southern Region has been uploaded on the SRPC website (www.srpc.kar.nic.in). Therefore, instead of export and Import values as per approved monitoring plan, the net electricity supplied to the grid has been used to calculate the emission reductions. Since, emission reduction calculation is based in the actual i.e. net electricity delivered to grid which was supposed to calculate with difference of export and import prior to deviation. Assessment team found that there is no impact of this in emission reductions, hence this is acceptable. Furthermore, the net electricity supplied to the grid is provided by government nodal agency, hence no any cross-checking is required.

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3.4 Grouped Project

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

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the remote audit, it was concluded that the project is implemented as per the instruction of the registered VCS PD/1/, and this is verified from the commissioning certificates/10/. During the current monitoring period it was observed that no unforeseen situation evolved which can impact the operation of the project activity. Breakdown summary is submitted by PP for the solar plants. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team/9/.

The total installed capacity of the project is 480 MW; which involves 30 MW and 40 MW capacity in Uttar Pradesh by Azure Power Jupiter Pvt Ltd and Azure Power Venus Pvt Ltd respectively, 100 MW in Telangana by Azure Power Thirty Seven Pvt Ltd, 50 MW in Andhra Pradesh by Azure Power Thirty Six Pvt Ltd and 260 MW in in Gujrat by Azure Power Thirty Three Pvt Ltd/10/. The technical parameters/specification have been verified by the assessment team through interview with site personal during the remote audit/09/with the nameplates as well as the same is also verified with the details as provided by the manufacturer/18/. The details of interconnection with grid of solar plants and commissioning details are given below;

Name of the SPVs	Capacity ((MW)	Commissioning date		
		Site	Capacity (MW)	Commissioning date
Azure Power Jupiter Pvt Ltd.	30	Hardoi	20	19-September-2017
		Hamirpur	10	22-September-2017
Azure Power Thirty Seven Pvt Ltd	100	Nagar Kurnool & Ranga Reddy	12-January-2018	
Azure Power Venus Pvt Ltd	40	Jalaun	14- April-2018	
Azure Power Thirty Six Pvt Ltd	50	Kurnool	30-April-2018	
Azure Power Thirty Three Pvt Ltd	260	Dhari	35	02-Novomber-2018
		Semali	30	10-December-2018
		Vadol	40	01-November-2018
		Netramali	40	07-March-2019
		Sanes	50	13-March-2019
		Muloj	40	22-February-2019
		Vartol	25	09-March-2019

The assessment team interviewed remotely with the plant site personals in order to verify the status of the project implementation of the monitoring plan. It has also been verified as per the guidelines in ACM0002: Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, Version 19.0 that the calculations for the GHG emission reductions are done in accordance with the aforesaid methodology/7/.

The assessment team also confirmed that the monitoring system for emission reduction calculation was in place and in accordance with the registered VCS PD/1/. However, PP has applied a deviation for monitoring of quantity of net electricity generation supplied by the SPV "Azure Power Thirty-Six Pvt Ltd"(50 MW) located in Andhra Pradesh. The monitoring of net electricity supplied to grid by this SPV was changed from November 2018 and now it is based on Settlement Mechanism (DSM). In DSM, PP provides forested energy generation (scheduled) in day time block (15 minutes each, total 96 blocks) in advance to the Sothern Regional Power Committee and invoicing are being done based on forecasted energy generation. Any deviation from forecasted generation is penalised which depends on magnitude of deviation.

The total schedule energy generation and the Actual electricity supplied by the project activity was maintained by the Southern Regional Power Committee (SRPC) Secretariat, Central Electricity Authority, Government of India. The actual electricity supplied is the net electricity supplied by this project to the grid. Regional Energy Account (monthly net export) for every month in respect of Southern Region has been uploaded on the SRPC website (www.srpc.kar.nic.in) .Therefore, instead of export and Import values as per approved monitoring plan, the net electricity supplied to the grid has been used to calculate the emission reductions. Since, emission reduction calculation is based in the actual i.e. net electricity delivered to grid which was supposed to calculate with difference of export and import prior to deviation. Assessment team found that there is no impact of this in emission reductions, hence this is acceptable

The nature of deviation is permanent. Since, emission reduction calculation is based in the actual i.e. net electricity delivered to grid which is was supposed to calculate with difference of export and import, hence this is acceptable.

During the current monitoring duration, no events have been found that can change the design of project.

The details of the SPVs for the project and their location of installation are mentioned in the table below:

Name of SPVs	Capacity in MW	Location	Latitude (N)	Longitude (E)
Azure Power Jupiter Pvt Ltd	20	Bibiyapur, Hardoi, Uttar Pradesh	27°35'12.9"	79°43'51.6"
	10	Raniganj/ Hamirpur, Uttar Pradesh	25°54'18.4"	79° 55' 10.1"
Azure Power Thirty Seven Pvt Ltd	100	Rachur, Marchal, & Veljal, Telangana	16°31'11.0"	77°53'49.0"
Azure Power Venus Pvt Ltd	40	Dakor,Jalaun, Uttar Prsdesh	25°51'07.1"	79°25'42.4"
Azure Power Thirty Six Pvt Ltd	50	Gani & Sakunala, Andhra Pradesh	14°01'30.6"	78°26'36.6"
Azure Power Thirty Three Pvt Ltd	35	Dhari, Bharuch,Gujarat	22°04'01.0"	72°37'01.0"
	30	Semaliya, Aravalli,Gujarat	23°13'37.3"	73°22'34.6"
	40	Vadol, Kheda, Gujarat	22°57'47.7"	73°12'59.1"
	40	Sanes,BhavnagarGujarat	21°54'11.6"	72°06'38.9"
	50	Vartol, Sabarkantha, Gujarat	24°05'32.7"	73°04'19.3"
	40	Netramali, Sabarkantha, Gujarat	23°46'13.2"	72°59'42.4"
	25	Muloj,Aravalli, Gujarat	23°30'52.9"	73°26'28.3"

These are the SPVs promoted by M/s. Azure Power India Pvt Ltd.

Capacity of the projects and date of commissioning verified with commissioning certificates/10/ and technical specifications provided by technology supplier/18/
Geo coordinates checked on google earth/17/ and also checked through onsite photographs share by PP and verification team conclude geo coordinates of project locations are consistent with registered PD.
Assessment team checked the technical details of the project activity from the manufactures specification and the detail are as follow:

Solar PV Project Technology Details –
The project activity aims to harness solar energy through installation of Solar PV project with total installed capacity of 480 MW.

The technical specification of 20 MW plant interconnection with grid on 19-September-2017 by Azure Power Jupiter Pvt Ltd have been verified through the technical specification provided by the supplier/18/ and commissioning certificates/4/. The same is provided in table below:

Sl. No.	Technical details of the equipment	Description
1	Make of modules installed	Hanwha 320 Watt peak
2	No. of the modules installed	62500
3	Make & Model of Invertor	ABB
4	Number of Inverters	10 Nos. Sr. Nos.-9171600403, 9171600393, 9171600395, 9171600404, 9171600408, 9171600396, 9171600405, 9171600394, 9171600406, 91733600099
5	Make & Number of Transformers	Make: Schneider, Nos.3, Sr. No.: TBI/8092872/5, TBI/8092872/6, TBI/8092873/4

The technical specification of 10 MW plant interconnection with grid on 22-September-2017 by Azure Jupiter Power Pvt Ltd have been verified through the technical specification provided by the supplier/18/ and commissioning certificates/4/. The same is provided in table below :

Sl. No.	Technical details of the equipment	Description
1	Make of modules installed	Hanwha 320 Watt pick
2	No. of the modules installed	31800
3	Make & Model of Invertor	ABB Type: Central
4	Number of Inverters	10 nos. Sr. No. of are 9171600403, 9171600393, 9171600395, 9171600404, 9171600408, 9171600396, 9171600405, 9171600394, 9171600406, 91733600099
5	Make & Number of Transformers	Make-ABB; 3 nos, Sr. No: TBI/8092872/5,

		TBI/8092872/6, TBI/8092873/4

The technical specification of 100 MW plant interconnection with grid on 12-January-2018 by Azure Power Thirty Seven Pvt Ltd have been verified through the technical specification provided by the supplier /18/ and commissioning certificates/4/. The same is provided in table below :

Sl. No.	Technical details of the equipment	Description
1	Make of modules installed	Make-Chint Solar, Make-Risen Solar.
2	No. of the modules installed	320 Wp-36.0 MWp-112500 nos. 325 Wp-23.99 MWp-73819 nos. 320 Wp-23.95 MWp-74869 nos. 325 Wp-16.22 MWp-49920 nos
3	Make & Model of Invertor	Make: ABB, Rating-1 MW
4	Number of Inverters	Sr. No: 9172200416, 9172200418, 9172200419, 9172200420, 9172200580, 9172200577, 9172200579, 9172200583, 9172200584, 9172200586, 9172200422, 9172200423, 9172200424, 9172200425, 9172200426, 9172200562, 9172200563, 9172200564, 9172200565, 9172200566, 9172200567, 9172200568, 9172200569, 9172200570, 912200571, 9172200276, 9172200588 to 9172200597, 9172300277, 9172200278, 9172300279, 9172400091 to 9172400101, 91724001421, 9172001400 to 9172001425, 91722005572 to 9172200576, 9172400103, 9172400104, 9172400109, 9172400112, 9172400117 to 9172400125, 9172001436 to 9172001440, 9172001411 to 9172001420, 9172001426 to 9172001435
5	Make & Number of Transformers	20 nos. of 4 MVA transformers, 33/0. 400/0. 400/0.400kV, Sr. No: 891022/01 to 891022 10 nos. of 2 MVA Transformers, 33/0.400/0.400 kV, Sr. No.:8191023/01 to 8191023

The technical specification of 40 MW plant interconnection with grid on 14-April-2018 by Azure Power Venus Pvt have been verified through the technical specification provided by the supplier /18/ and commissioning certificates/4/. The same is provided in table below

Sl. No.	Technical details of the equipment	Description
1	Make of modules installed	Make-Hanwha SolarOne, Hanwha Q Cells, 320 Wp/HSL 72 P6-PC-1-320 at 1000 V, 320

		Wp/ Q. POWER L-G5.2 320 at 1500V ,
2	No. of the modules installed	148020 nos
3	Make & Model of Invertor	Inverter cum transformers Make: ABB and Schneider Electric,
4	Number of Inverters	24 Nos.
5	Make & Number of Transformers	Inverter cum transformers Make: ABB and Schneider Electric,

The technical specification of 50 MW plant interconnection with grid on 30-April-2018 by Azure Power Thirty Six Pvt Ltd Pvt Ltd have been verified through the technical specification provided by the supplier/18/ and commissioning certificates/4/. The same is provided in table below :

Sl. No.	Technical details of the equipment	Description
1	Make of modules installed	Hanwha Q Cells,
2	No. of the modules installed	320 Wp, 1000V= 31200 Nos 325 Wp, 1000V= 96080 Nos 325 Wp, 1500V=36480 Nos 330 Wp, 1000V= 18600 Nos Total Power= 59.204 MWp (DC) =50 MW (AC)
3	Make & Model of Invertor	• Make- ABB India Ltd & TBEA, • Ratings: 1732 KW, 1000 KW and 2500 KW
4	Number of Inverters	1732-23 Nos, 1000 KW, 2500 KW- 4 Nos.
5	Make & Number of Transformers	• **Current Transformer** ▪ Make: ECS ▪ Quantity: 06 ▪ S. No.: R Ph-17/045084, Y Ph- 17/045083, B Ph – 17/045082, R Ph- 17/045087, Y Ph- 17/045086, B Ph- 17/045085 ▪ Ratio: 500-1000/1A, 5 VA, CL 0.2S • **Potential Transformer** ▪ Make: ECS ▪ Quantity: 6 ▪ S. No.: R Ph- 17/014965, Y Ph- 17/014964, B Ph- 17/014963, R Ph – 17/014968, Y Ph- 17/014967 and B Ph – 17/014966 ▪ Ratio: (33KV/√3)(110V/√3), 50VA, Cl 0.2s

The technical specification of 260 MW plants and interconnection with grid by Azure Power Thirty three Pvt Ltd have been verified through the technical specification provided by the supplier/18/ and commissioning certificates/4/. The same is provided in table below :

Location	Installed Capacity (MWp)	Interconnection with grid	Technical Specifications
Dhari	35	02-Nov-2018	• SPV Modules- Type/Make: Polycrystalline/GCL, Talesun, Risen • Number of photovoltaic modules/Rating: 61440/330 Wp, 66240/325 Wp, 7680/335 Wp • Inverters-Type/Make: Central/Schneider • Nos. of inverter/Rating-17/2 MW, 2/0.68 MW
Semaliya	30	10-Dec-2018	• SPV Modules-Type / Make: Polycrystalline/Risen, Talesun • Number of Photovoltaic modules/Rating: 48300/325 Wp, 67620/330 Wp • Inverters-Type/Make: Central/TMEic • Numbers of inverter/Rating-12/2.55 MW
Vadol	40	01-Nov-2018	• SPV Modules-Type/Make: Polycrystalline/GCL, Talesun, Risen • Number of Photovoltaic modules/Rating: 38640/330 Wp, 19320/325 Wp • Inverters-Type/Make: Central/TMEic • Numbers of inverter/Rating-06/2.55 MW
Netramali	40	07-Mar-2019	• SPV Modules-Type/Make: Polycrystalline/Waaree Solar • Number of Photovoltaic modules/Rating: 22800/325 Wp, 160800/330 Wp • Inverters-Type/Make: Central/TMEic • Numbers of inverter/Rating-16/2.5 MW
Sanes	50	13-Mar-2019	• SPV Modules-Type/Make: Polycrystalline/Waaree • Number of Photovoltaic modules/Rating: 912160/325 Wp, 136800/330 Wp • Inverters-Type/Make: Central/TMEic • Numbers of inverter/Rating-20/2.5 MW
Muloj	40	22-Feb-2019	• SPV Modules-Type/Make: Polycrystalline/Waaree, Talesun, Risen,

Location	Installed Capacity (MWp)	Interconnection with grid	Technical Specifications
			JA Solar • Number of Photovoltaic modules/Rating: 80640/325 Wp, 102600/330 Wp • Inverters-Type/Make: Central/TMEic • Numbers of inverter/Rating-16/2.5 MW
Vartol	25	09-Mar-2019	• SPV Modules-Type/Make: Polycrystalline/Talesun, GCL • Number of Photovoltaic modules/Rating: 34560/325 Wp, 11520/330 Wp • Inverters-Type/Make: Central/TMEic • Numbers of inverter/Rating-04/2.55 MW

Assessment team concludes the following:

a) The implementation status of project activity was found to be in compliance with registered PD/1/.

b) DOE has conducted the remote audit to confirm the implementation status of the project/9/.

c) The commissioning date of the project activity was found to be accurately and consistently recorded/10/.

d) The actual operation of project activity was found to be in compliance with the flow diagram provided in registered PD/1/.

e) The emission reductions achieved during the current monitoring period are 493,604 tCO2e.

The project activity contributes to the sustainable development by utilising solar energy for generating electricity which otherwise would have been generated through fossil fuels. Thereby reduction in usage of non-renewable sources used to generate energy.

Further the GHG emission reductions generated by the project activity has not been included by any other an emissions trading program or any other mechanism that includes GHG allowance trading. Also, the project has not received any other form of environmental credit and has not been participated/rejected under any other GHG programs.

Sustainable Development- The project will contribute to the sustainable development in the following ways:

1. Environmental: Since the project activity leads to cleaner production of energy, it is leading to displacement of fossil fuel-based energy.
2. Social: Setting up of the project activity has created new job openings hence is supporting employment of the local people around.
3. Cleaner Air: Since the project activity leads to lesser GHG emission it results in better air quality

Further the project has been implemented as described in the Project Description/1/. CAR 01, CAR 02, CAR 03 and CAR 04 were raised on the editorial issue of description and same were resolved by revision in the MR.

The total emission reductions achieved in this monitoring period i.e. from 01-July-2019 to 29-February-2020 (including both days) are 493,604 tCO_2e.

4.2 Safeguards

4.2.1 No Net Harm

As PP does not see and identify any potential negative environmental and socio-economic impacts, hence this section is not required.

4.2.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration hence not applicable in the current monitoring period. However, PP has kept a dedicated visitor cum grievance register at the project site which is accessible to stakeholders to provide their feedback on the project as an ongoing communication with local stakeholders. PP has also provided an interface at http://www.azurepower.com/contact-us where suggestion and the grievance can be submitted. This is in compliance with the requirement of para 3.16.4 of VCS standard, Ver4.0. Assessment team has checked the grievances register and confirms that there are no any grievances received during the current monitoring period/28/.

4.3 AFOLU-Specific Safeguards

This is non AFOLU projects, hence this section not applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the MR.
Findings	CAR 06 and CAR 07 was raised during the verification process and closed successfully. Refer Appendix 2 of this report for the detail closure of the CAR.
Conclusion	**Ex-ante Parameter:**

	$EF_{grid,OM,y}$ = Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.9610 tCO_2/MWh. Verification team found same was used in the ER calculations. Ex ante value of emission factor is taken from CEA database, Ver. 14, December, 2018. Verification team checked the EF value and found in consistent with registered PD **$EF_{grid,BM,y}$ =** Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.8644 tCO_2/MWh. Verification team found same was used in the ER calculations. Ex ante value of emission factor is taken from CEA database, Ver. 14, December, 2018. Verification team checked the EF value and found in consistent with registered PD **$EF_{grid,CM,y}$** = Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.9368 tCO_2/MWh. Verification team found same was used in the ER calculations. Ex ante value of emission factor is taken from CEA database, Ver. 14, December, 2018. Verification team checked the EF value and found in consistent with registered PD. **Baseline Emissions:** The baseline Emissions for a given year is calculated by multiplying the energy baseline with the grid emission factor. The grid in this case would be the 'Indian Grid' Formula Used: - $$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$ The project activity is greenfield plant and in accordance with the para 44 of methodology ACM 0002, ver 19, $$EG_{PJ,y} = EG_{facility,,y}$$ Therefore, $$BE_y = EG_{facility,y} \times EF_{grid,CM,y}$$ Where: BE_y = Baseline emissions in year *y* (t CO_2/yr) $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr) $EG_{facility\ y}$ = Quantity of net electricity generation supplied by the project (solar) plant/unit to the grid in year *y* (MWh/yr)

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO_2/MWh)

Monitored Parameter:

$EG_{facility,y}$ = 526,908.90 MWh

The verification team has checked the entire monthly JMR reports/State Energy Accounting/Regional Energy Account/06/ for net electricity generated & supplied to the grid and crosschecked same with the invoices/05/ raised by PP towards State Utilities for the monitoring period. All values are found correct. All the parameters are monitored and recorded as per the monitoring plan in the MR. However, PPs have apportioned the values for the first and last month of the monitoring period where dates are not matching with JMR cycle in AP and Telangana states. Apportioning found appropriate and conservative. The billing meters are installed in switchyard of each SPV and connected to substations of respective states utilities (Refer Appendix 5 of this report). The details of monitoring equipment installed at each SVP are given below;

Name of the SPVs	Site	Main Meter Details	Check Meter Details
Azure Power Jupiter Pvt Ltd	Hardoi	SL. No.: UP-0015E[1] Make: EDMI Accuracy class: 0.2 s	SL. No.: UP-0015E[2] Make: EDMI Accuracy class: 0.2 s
		SL. No.: UP-0202-A Make: L&T Accuracy class: 0.2 s	SL. No.: UP-0203-A Make: L&T Accuracy class: 0.2 s
	Hamirpur	SL. No.: 0015197361 Make: L&T Accuracy class: 0.2 s	SL. No.: UP-0008-A Make: L&T Accuracy class: 0.2 s
Azure Power Thirty Seven Pvt Ltd	Rachu, Marchal and Veljal	SL. No.: APZ00498 Make: Secure Accuracy class: 0.2 s	SL. No.: APZ00499 Make: Secure Accuracy class: 0.2 s
Azure Power Venus Pvt Ltd	Dakore	**Aata Substation Circuit-I** Main Meter SL. No.: UP3383A Make: Secure Accuracy class: 0.2 s **Aata Substation Circuit-II** Main Meter:	**Aata Substation Circuit-I** Check Meter: SL. No.: UP3384A Make: Secure Accuracy class: 0.2 s **Aata Substation Circuit-II** Check Meter:

[1] Meter change on 01-03-2019 for both main and check meter

[2] Meter change on 01-03-2019 for both main and check meter

		SL. No.: UP3381A Make: Secure Accuracy class: 0.2 s	SL. No.: UP3382A Make: Secure Accuracy class: 0.2 s
Azure Power Thirty Six Pvt Ltd	Anantppuram	SL. No.: APZ00507 Make: Secure Accuracy class: 0.2 s	SL. No.: APZ00508 Make: Secure Accuracy class: 0.2 s
Azure Power Thirty Three Pvt Ltd	Dhari	SL. No.: GJ-3977-A Make: EDMI Accuracy class: 0.2 s	SL. No.: GJ-3979-A Make: EDMI Accuracy class: 0.2 s
	Semaliya	SL. No.: GJ-4049-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-4050-A Make: EDMI Accuracy class: 0.2 s
	Vadol	SL. No.: GJ-3980-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-3981-A Make: EDMI Accuracy class: 0.2 s
	Netramali	SL. No.: GJ-4095-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-4096-A Make: EDMI Accuracy class: 0.2 s
	Sanes	SL. No.: GJ-4145-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-4146-A Make: EDMI Accuracy class: 0.2 s
	Muloj	SL. No.: GJ-4093-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-4094-A Make: EDMI Accuracy class: 0.2 s
	Vartol	SL. No.: GJ-4047-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-4048-A Make: EDMI Accuracy class: 0.2 s

Furthermore, PP has applied a deviation in monitoring plan of of Azure Power Thirty Six Pvt Ltd (50 MW) located in Andhra Pradesh. The monitoring of net electricity supplied to grid by this SPV was changed in November 2018 and now it is based on Settlement Mechanism (DSM). The same was verified with the Regional Energy Accounts (JMRs) issued by South Power Committee/6/. In DSM, PP provides forested energy generation (scheduled) in day time block (15 minutes each, total 96 blocks) in advance to the Sothern Regional Power Committee and invoicing was done based on forecasted energy generation. Any deviation from forecasted generation is penalised which depends on magnitude of deviation.

Details of deviation and assessment is already provided in Section 3.3 of this report above.

The nature of deviation is permanent. Since, emission reduction calculation is based in the actual i.e. net electricity delivered to grid which was supposed to calculate with difference of export and import prior to deviation. Assessment team found that there is no impact of this in ERs, hence this is acceptable.

	The verification team has crosschecked the revised emission reduction sheet and monitoring report data with the JMR sheet and invoice and found all the values are matching. PE_y = As per ACM0002 - Version 19.0, all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected. As the project activity involved wind power project emissions (PE_y) are taken as zero. Leakage: As per ACM0002 - Version 19.0, Leakage emissions are not considered for the project activity.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

<table>
<tr><td>Means of verification</td><td>The verification team checked the break down log for the monitoring period. During the remote verification audit and the feeder wise location of the solar plants is also checked.
The metering arrangement is tri-vector bi-directional energy meters (main and check) installed at the switchyard and respective State Electricity Board (SEB) substations as mentioned in table below. The site wise location of meter and name of substations are given below. The same is verified with the onsite photographs and commissioning certificates
<table>
<tr><th>Name of the SPVs</th><th>Site</th><th>Main Meter Details</th><th>Check Meter Details</th><th>Billing Energy Meter Location</th><th>Connected Substation</th></tr>
<tr><td rowspan="3">Azure Power Jupiter Pvt Ltd</td><td rowspan="2">Hardoi</td><td>SL. No.: UP-0015E Make: EDMI Accuracy class: 0.2 s</td><td>SL. No.: UP-0015E Make: EDMI Accuracy class: 0.2 s</td><td rowspan="2">132 kV grid sub station SRI MAU, Hardoi</td><td rowspan="2">SRI MAU, Hardoi</td></tr>
<tr><td>SL. No.: UP-0202-A Make: L&T Accuracy class: 0.2 s</td><td>SL. No.: UP-0203-A Make: L&T Accuracy class: 0.2 s</td></tr>
<tr><td>Hamirpur</td><td>SL. No.: 0015197361 Make: L&T Accuracy class: 0.2 s</td><td>SL. No.: UP-0008-A Make: L&T Accuracy class: 0.2 s</td><td>132,kV Grid substation, Hamirpur</td><td>Patara Village, Hamirpur</td></tr>
<tr><td>Azure Power Thirty Seven Pvt Ltd</td><td>Rachu, Marchal and Veljal</td><td>SL. No.: APZ00498 Make: Secure Accuracy class: 0.2 s</td><td>SL. No.: APZ00499 Make: Secure Accuracy class: 0.2 s</td><td>220/132 KV SS Kalwakurthy</td><td>Rachur, Kalwakurthy, Nagarkurnool</td></tr>
<tr><td>Azure Power Venus Pvt Ltd</td><td>Dakore</td><td>Aata Substation Circuit-I Main Meter SL. No.: UP3383A</td><td>Aata Substation Circuit-I Check Meter: SL. No.: UP3384A</td><td>400 KV, Bhadrikhi Substation</td><td>Bhadrikhi</td></tr>
</table></td></tr>
</table>

			Make: Secure Accuracy class: 0.2 s **Aata Substation Circuit-II** Main Meter: SL. No.: UP3381A Make: Secure Accuracy class: 0.2 s	Make: Secure Accuracy class: 0.2 s **Aata Substation Circuit-II** Check Meter: SL. No.: UP3382A Make: Secure Accuracy class: 0.2 s	,Orai, Uttar Pradesh	
	Azure Power Thirty Six Pvt Ltd	Anantppuram	SL. No.: APZ00507 Make: Secure Accuracy class: 0.2 s	SL. No.: APZ00508 Make: Secure Accuracy class: 0.2 s	Anantppuram ultra mega Solar Park, Veligallu & Tumkunta Galiveedu, Kadapa	Veljal
	Azure Power Thirty Three Pvt Ltd	Dhari	SL. No.: GJ-3977-A Make: EDMI Accuracy class: 0.2 s	SL. No.: GJ-3979-A Make: EDMI Accuracy class: 0.2 s	Energy Meter- At plant switchyard	Chidra
		Semaliya	SL. No. : GJ-4049-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-4050-A Make: EDMI Accuracy class: 0.2 s	Energy Meter- At plant Switchyard	In D block Semaliya
		Vadol	SL. No. : GJ-3980-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-3981-A Make: EDMI Accuracy class: 0.2 s	Energy Meter- At Plant Switchyard	Malitadi
		Netramali	SL. No. : GJ-4095-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-4096-A Make: EDMI Accuracy class: 0.2 s	Energy Meter- At Plant Switchyard	Malitadi
		Sanes	SL. No. : GJ-4145-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-4146-A Make: EDMI Accuracy class: 0.2 s	Energy Meter- At Plant Switchyard.	Sanes
		Muloj	SL. No. : GJ-4093-A Make: EDMI Accuracy class: 0.2 s	SL. No. : GJ-4094-A Make: EDMI Accuracy class: 0.2 s	Energy Meter- At plant Switchyard	Sinavad
		Vartol	SL. No. : GJ-4047-A	SL. No. : GJ-4048-A	Energy Meter- At	Vartol (300m away from plant)

		Make: EDMI Accuracy class: 0.2 s	Make: EDMI Accuracy class: 0.2 s	Plant Switchyard	

These meters record parameters including electricity exported & imported. Moreover, the meters are located at the HT side of the transformer and are of accuracy class of 0.2s for project activity applied for verification.

These electricity meters are being used by state electricity board for JMR (Joint Meter Reading)/credit note electricity generation statements. The Net electricity supplied to the grid is then calculated from export and import values. The net electricity exported to the grid is also cross checked from the invoices raised to respective state electricity board which is in line with Methodology requirement for large scale project activity. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and O&M personnel. In the event of failure of main meter, the check meter is used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&M of numerous other solar farm projects. Verification team confirms the metering process by interviewing the O&M personnel and PP representatives during remote audit and found the monitoring process is in line with approved PD.

Calibration of all the meters is done by state electricity board officials as per the industry standards. The calibration is done once in a 5 year/19/ as per calibration frequency in registered VCD PD/1/. The details of Calibration of the meters as confirmed during remote verification audit and calibration certificates are mentioned in Appendix 5 of this report. The assessment team checked the same and found correct.

The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly, O&M contractor is responsible for monitoring of the generation data at CMS.

PP representatives confirmed that the CMS data as well as JMR sheets and invoices will be kept for 2 years following the end of the crediting period. During remote audit and discussion with PP, assessment team confirm that the data will be kept for 2 years following the end of the crediting period.

The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the remote audit by interviewing O&M personnel and checking of records/ log books maintained at site.

Findings	CAR 8 raised during the verification process which was closed successfully. Refer Appendix 2 of this report for the detail closure of the CAR
Conclusion	The assessment team confirms that the value of net electricity exported to the grid as used in emission reduction calculation is correct. The verification team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity. Interview with O&M personnel during remote verification audit also confirms

	that the operational and organizational chart as mentioned in MR is as per the site practice and thus assessment team confirms that the details are correct. The break down log is checked and found that the solar Panels undergone scheduled maintenance as per the guideline provided by the manufacturer which is acceptable to the assessment team. No unforeseen incident observed during the monitoring period which could alter the applicability of the methodology or change in project specification as mentioned in the registered PDD. The project undergone Continuous operation from the inception/commissioning and the same is confirmed from the JMR reports and invoices raised for the said period of verification. Comparison of actual and estimate emission reductions achieved: Assessment team checked the calculation of estimated VER vs. Actual VER. As per the registered VCS PD the amount of VERs annually is 852,639 tCO2e. The days involved in present monitoring period are 244. Therefore, on pro-rata basis, the estimated VERs for the monitoring period is 569,983 tCO2e. Actual VERs obtained for the monitoring period is 493,604 tCO_2e and thus the actual VER is 13.40% lower than the estimated VER. This variation is majorly due to the variations in availability of sunny days, climatic conditions, grid availability and other parameters which are not in the control of PP. Hence verification team confirms that decrease in VER by 13.40% in this monitoring period is acceptable.

4.6 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
NA	NA	NA	NA	NA

5 VERIFICATION CONCLUSION

Earthood Services Private Limited (Earthood), contracted by Azure Power India Pvt Ltd, has performed the independent verification of the emission reductions for the VCS project activity reference number 1931“ Energising India using Solar Energy Projects” in India for the monitoring period 01-July-2019 to 29-February-2020 reported in the Monitoring Report Version 03 dated 22-June-2020.

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

Earthood commenced the verification on the basis of the baseline and monitoring methodology “ACM0002 - Version 19.0», the monitoring plan contained in the PD version 03 and VCS guidelines

version 4.0, Monitoring Report Version 03 dated 22-June-2020 as per the process described under Section 2 of this report.

Earthood's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 01-July-2019 to 29-February-2020 are fairly stated in the Monitoring Report Version 03 dated 22-June-2020. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology "ACM0002 - Version 19.0" and the VCS standard.

Verification period: 01-July-2019 to 29-February-2020 (inclusive of both days).

Verified GHG emission reductions and removals in the above verification period:

Year[3]	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2019	340,482	0	0	340,482
2020	153,122	0	0	153,122
Total	**493,604**	**0**	**0**	**493,604**

Approved by

Dr. Kaviraj Singh

Managing Director **Date: 18-Septemebr -2020**

Earthood Services Privated Limited **Place: Gurgaon, Haryana**

[3] Year wise vintage breakup of the emission reductions not possible as JMR cycle of each SPV is different and not coinciding with 31st December 2019.

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED (VERIFICATION)

S.No	Title of Document	Version	Date
1.	Registered VCS PD	version 03	17-September-2019
2.	Final VCS Monitoring Report	03	22-June-2020
3.	ER spreadsheet (corresponding to the final monitoring report)	02	22-June-2020
4	Certificates of commissioning for Calibration for all the meters belongs to project activity	-	-
5.	Invoice issued by PP for the duration of monitoring period (01-July-2019 to 29-Feb-2020) Break up: 01 July-2019 to 31-Dec-2019 1-Jan-2020 to 29-Feb-2020	-	-
6.	Joint Meter Readings/Regional Energy Accounts(in case of AP)/State Energy Account(in case of Gujrat) for the duration of monitoring period (01-July-2019 to 29-Feb-2020) Break up: 01 July-2019 to 31-Dec-2019 1-Jan-2020 to 29-Feb-2020	-	-
7.	"Consolidated baseline methodology for grid-connected electricity generation from renewable sources", ACM0002,	Version 19.0	-
8.	CO_2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Govt.	version 14	December, 2018
9.	Remote Audit through Skype video call/Telephonic discussions	-	28-May-2020
10.	Commissioning certificate for all the Solar plants of the project activity Azure Power Jupiter Pvt. Ltd. (20 MW) Azure Power Jupiter Pvt. Ltd. (10 MW) Azure Power Thirty Seven Pvt (100 MW) Azure Power Venus Pvt (40 MW) Azure Power Thirty Six Pvt Ltd (50 MW) Azure Power Thirty Three Pvt Ltd (260 MW) - Dhari (35 MW) - Semali (30 MW) - Vadol (40 MW) - Netramali (40 MW) - Sanes (50 MW) - Muloj (40 MW) - Vartol (25 MW)	-	 19-Sept.-2017 22-Sept.2017 12-Jan-2019 14-April-2018 30-April-2018 02- Nov-2018 10-Dec-2018 01-Nov-2018 07-Mar-2019 13-Mar-2019 22-Feb-2019 09-Mar-2019
11.	Power Purchase Agreements : Azure Power Jupiter Pvt. Ltd. (30 MW)	-	 29-April-2016

S.No	Title of Document	Version	Date
	Azure Power Thirty Seven Pvt (100 MW) Azure Power Venus Pvt (40 MW) Azure Power Thirty Six Pvt Ltd (50 MW) Azure Power Thirty Three Pvt Ltd (260 MW)		10-Aug-2016 12-Oct.-2016 26-Sept.2016 24-Oct.-2017
12.	VCS webpage for the project, VCS ID 1931; https://registry.verra.org/app/projectDetail/VCS/1931	-	Last accessed on 07-July-2020
13.	O&M contract for all project sites	-	-
14.	VCS Standard	Version 4.0	Last accessed on 13-March-2020
15.	VCS Program Guide	Version 4.0	Last accessed on 13-March-2020
16	Letter of declaration dated from PP regarding not having created or sought any other form of environmental credit for the same period and double counting	-	11-June-2020
17	Google Earth desktop/Mobile application	-	Last accessed on 28-May-2020
18	Technical specifications by technology supplier		
19	Meter calibration guidelines: http://cea.nic.in/reports/regulation/CEA_metering_regulation_amendment_2019.pdf	-	-
20	Photograph of site/Name plates		
21	Verification report of the second monitoring period.	Version 01	18-September-2019
22	Ministry of Home Affairs Order https://www.mha.gov.in/sites/default/files/MHAorder%20copy.pdf		24-March-2020
23	Ministry of Home Affairs Order (D.O No.40-3/2020-DM-I(A) https://www.mha.gov.in/sites/default/files/MHA%20DO%20letter%20dt.14.4.2020%20to%20Chief%20Secretaries%20and%20Administrators%20for%20strict%20implementation%20of%20Lockdown%20Order%20during%20extended%20period.pdf		14-April-2020
24	Ministry of Home Affairs Order (Order No.40-3/2020-DM-I(A) https://www.mha.gov.in/sites/default/files/MHA%20Order%20Dt.%201.5.2020%20to%20extend%20Lockdown%20period%20for%202%20weeks%20w.e.f.%204.5.2020%20with%20new%20guidelines.pdf		01-May-2020
25	https://www.mha.gov.in/sites/default/files/MHAOrderextension_1752020_0.pdf		17-May-2020
26	Break down log sheet of Plants	-	-
27	Skill development training records	-	-
28	Copies of the grievance registers maintained at sites	-	-

APPENDIX 2: CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS (CAR/CL/FAR)

Table 1. Remaining FAR from previous verification

FAR ID	XX	**Section no.**	E.2	**Date :** DD/MM/YYYY
Description of FAR				
There is no FAR from the validation of the project activity				
Project participant response				**Date :** DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				**Date:** DD/MM/YYYY
NA				

Table 2. CL from this verification

CL ID	XX	Section no.	1.1	Date: DD/MM/YYYY
Description of CL				
NA				
Project participant response				Date: DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

Table 3. CAR from this verification

CAR ID	01	**Section no.**	4.1	**Date :** 29/05/2020
Description of CAR				

Version number of applied methodology is not consistent throughout the MR. Corrections sought.	
Project participant response	**Date :** 06/06/2020
Version number of applied methodology now been updated throughout the MR.	
Documentation provided by project participant	
MR V2	
DOE assessment	**Date:** 17/06/2020
PP has updated the version number of applied methodology in revised MR. CAR closed.	

CAR ID	02	Section no.	4.1	Date : 29/05/2020
Description of CAR				
PP requested to submit all relevant supporting documents like commissioning certificates, Technical specifications, O&M agreements, break down details, PPA, training records, etc. of all SPV involved in the project activity for review by assessment team.				
Project participant response				Date : 06/06/2020
Commissioning certificates, technical documents, O&M Agreement, breakdown details, PPA, training records and other relevant documents have been provided.				
Documentation provided by project participant				
Commissioning certificates, O&M Documents, breakdown details, PPA and training records				
DOE assessment				Date: 17/06/2020
Verification team has reviewed supporting evidences provided by PP and found that the following documents are still not provided: 1. Commissioning dates of each SPV is not provided in MR. PP to provide the commissioning dates of each plants in MR. 2. Technical specifications of plants are missing in MR. 3. O & M agreement of plants located in Gujarat is still missing. PP to provide the same. 4. Training records are still missing 5. Break down details are still missing CAR remains open				
Project participant response				Date : 22/06/2020
1. Commissioning certificates copies is being provided for all plants 2. Technical specifications is being added to section 3.1 of the MR. 3. O&M agreement of Gujarat plant is being provided. 4. Training records are now provided for every site. 5. Major Breakdown details are being added to the appendix 2 of MR.				
Documentation provided by project participant				
MR V3, Commissioning certificates, O&M agreement, training records and major breakdown sheet.				

DOE assessment	Date: 23//06/2020
1. Commissioning dates of all solar power plants are now included in Section 3.1 of revised MR. PP has also provided the commissioning certificates of all plants. Assessment team has checked the commissioning certificates and confirms that commissioning dates are correct. 2. Technical specifications of all solar plants have been included now in Section 3.1 of revised MR. 3. PP has provided the copies of O & M Agreement for all solar Power Plants including Solar plants installed and commissioned in Gujarat. 4. Technical and soft skill development training records for the all site have been now provided by the PP and found inline with the interviews with the PP. 5. Break down details of plants are included in Appendix-2 of the revised MR. CAR thus closed for all points.	

CAR ID	03	Section no.	4.1	Date : 29/05/2020
Description of CAR				
Section 3.1of the MR missing information on "The operation of the project activity(s) during this monitoring period, including any information on events that may impact the GHG emission reductions or removals and monitoring".				
Project participant response				Date : 06/06/2020
The section 3.1 of the MR has been updated. The latest version of the MR is submitted to the DOE for the assessment.				
Documentation provided by project participant				
MR V2				
DOE assessment				Date: 17/06/2020
PP has included "the operation of the project activity(s) during this monitoring period, including any information on events that may impact the GHG emission reductions or removals and monitoring" in revised MR. CAR closed.				

CAR ID	04	Section no.	4.1	Date : 29/05/2020
Description of CAR				
PP requested to submit declaration in effect of avoiding double counting with regard to participation under other GHG Programs/Other forms credits, rejection under other GHG program etc.				
Project participant response				Date : 06/06/2020
No Double counting declaration is being provided.				
Documentation provided by project participant				
Declaration				

DOE assessment	Date: 17/06/2020
PP has submitted declaration (dated 11/06/2020) in effect of avoiding double counting with regard to participation under other GHG Programs/Other forms credits, rejection under other GHG program. CAR closed.	

CAR ID	05	Section no.	4.2.2	Date : 29/05/2020
Description of CAR				
Section 2.2 of MR is not clear about any comments received during monitoring period. PP also requested to submit copies of grievance registers.				
Project participant response				Date : 06/06/2020
The Section have been updated as per the MR template.				
Documentation provided by project participant				
Grievance register copy				
DOE assessment				Date: 17/06/2020
PP has revised the section 2.2 of MR to include the comments and also submitted the feedback/grievances registers. Verification team has reviewed the grievances registers and confirms that no any grievances received during the current monitoring period. Hence, CAR closed.				

CAR ID	06	Section no.	4.4	Date : 29/05/2020
Description of CAR				
PP requested to submit all supporting documents for calculation of net electricity generation supplied by the project activity along the copies of invoices for cross checking.				
Project participant response				Date : 06/06/2020
Calibration Reports, JMRs and Invoices for the complete monitoring period is being provided.				
Documentation provided by project participant				
Calibration Reports, JMRs and Invoices				
DOE assessment				Date: 17/06/2020
PP has submitted the copies of JMRs, Invoices and Calibration reports. Verification team has reviewed the supporting evidences and found following inconsistencies; 1. Electricity export - import for Hardoi (20 MW plant) of Azure Power Jupiter Pvt.Ltd for the month of August 2019 is not consistent with the JMR. 2. In case of Azure Power Thirty Seven Pvt Ltd, billing cycle in JMR is from 26th to 27th day of month. However, it is not clear how PP has considered the electricity generation in ER sheet from 1st day to last day of month (for example 01/07/2019 to 31/07/2019). Further, JMR of Azure Power Thirty Seven Pvt Ltd. is missing for the month April 2020. 3. In case of Azure Power Thirty Six Pvt Ltd., ER sheet contains Scheduled Net kWh and Actual Net				

kWh. However, it is not clear how Actual Net kWh has been obtained. Further, there is inconsistency in Energy export data in ER sheet and JMR for the complete months.

4. JMR data is missing from 01/01/2020 to 30/04/2020 for Azure Power Thirty Three Pvt. Ltd.

PP is requested to provide response of above findings.

CAR remains Open.

Project participant response	Date : 22/06/2020

1. Export Import values are now consistent with JMR values.
2. Billing cycle has now being corrected and its now consistent with JMRs.
3. The inconsistent has been omitted, the actual values is measured by the state nodal dispatch centre. The monitoring deviation is explained in section 3.2.2.
4. JMR values is being provided for the Azure Power Thirty Three Pvt. Ltd.

Documentation provided by project participant

JMR copies and updated MR

DOE assessment	Date: 23/06/2020

1. PP has updated the electricity export and Import values in revised ER sheet and found consistent with JMR values and invoices.

2. PP have now apportioned the values for the first and last month of the monitoring period where dates are not matching with JMR cycle in AP and Telangana states. Apportioning found appropriate and conservative. Further, JMR of Azure Power Thirty Seven Pvt Ltd. for the month of April 2020 have been submitted and values in ER sheet found correct.

3. PP has requested one deviation in monitoring parameter of Azure Power Thirty Six Pvt Ltd (50 MW) located in Andhra Pradesh. The monitoring practice is revised and shifted to Deviation Settlement Mechanism (DSM) in order to more strengthen the national grid. The export and import values are omitted. In DSM, PP have to forecast energy generation in a day time block (In India, 15 minutes each, total 96 blocks) well in advance. The invoicing is done on the forecasted value. The actual generation deviation from the forecasted values is penalized, it depends upon the deviation magnitude. Therefore, instead of export and import values, the net values are directly obtained for the emission reduction calculation.

   Total Energy schedule and the Actual Values (which is the net electricity delivered to grid) is maintained by the Southern Regional Power Committee (SRPC) Secretariat, Central Electricity Authority, Government of India. Regional Energy Account (monthly net export) for every month in respect of Southern Region has been uploaded on the SRPC website, www.srpc.kar.nic.in. Since the document is provided by government nodal agency, therefore no any cross-checking is required.

   The nature of deviation is permanent. Since, emission reduction calculation is based in the actual i.e. net electricity delivered to grid which was supposed to calculate with difference of export and import prior to deviation. Assessment team found that there is no impact of this in ERs, hence this is acceptable.

4. PP has updated the JMR data (export and import) in revised ER sheet. Assessment team has

checked the electricity export and import data in JMRs and confirms that values are correct. CAR has been closed.

CAR ID	07	Section no.	4.4	Date : 29/05/2020
Description of CAR				
Following discrepancies observed during review of ER sheet: 1. Reference of systems file location is showing in many cells. 2. Net electricity supplied to grid as per invoices are missing. Thus, PP is requested to provide ER sheet with all values and supporting.				
Project participant response				**Date :** 06/06/2020
ER sheet have been updated. Invoice is being provide.				
Documentation provided by project participant				
ER V2				
DOE assessment				**Date:** 17/06/2020
PP has updated the ER sheet and included the net electricity export data in ER sheet. CAR is closed.				

CAR ID	8	Section no.	4.5	Date : 29/05/2020
Description of CAR				
PP requested to submit copies of the calibration certificates/meter replacement records to justify calibration frequency compliance throughout monitoring period.				
Project participant response				**Date :** 06/06/2020
Being Green field project activity and commissioned within 3 years, all meters are used for monitoring purpose are pre calibrated before installation as per state electricity board regulations, thus installed pre calibrated meters have validity of calibration till 5 years of commissioning date. The current monitoring period is within 2 years of commissioning date, thus all meters initial calibration is valid for current monitoring period. The meters are tested by state electricity board during commissioning, thus all meters have valid calibration period during current monitoring period.				
Documentation provided by project participant				
Energy Meter Calibration Records				
DOE assessment				**Date:** 17/06/2020
Meter installation / Calibration is not under the control of the PP. Pre-calibrated meters were installed during the commissioning of the SPVs. Same was evident from the commissioning certificates submitted by PP & confirmed during interviews with PP. Same was also crosschecked from the previous joint validation and verification report. CAR thus closed.				

Table 4. FAR from this verification

FAR ID	XX	Section No.		Date : DD/MM/YYYY
Description of FAR				
There is no FAR from this verification				
Project participant response				Date : DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Competence Statement			
Name	Atul Takarkhede		
Education	Ph.D. Environmental Science		
Experience	12 years		
Field	Climate Change and environment		
Approved Roles			
Team Leader	YES		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	YES (1.2)		
Reviewed by	Shreya Garg	Date	24/04/2019
Approved by	Anshika Gupta	Date	25/04/2019

Competence Statement			
Name	Sanjeev Kumar		
Country	India		
Education	B. Tech. (Chemical Engineering) M.Tech. (Energy Management)		
Experience	13.5 years +		
Field	Climate Change, Environment, Energy		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	YES (ACM0002, ACM0006, ACM0004, ACM0009, ACM0012, ACM0001, AMS I.D, AMS I.F, AMS I.C, AMS I.A, AMS II.D, AMS II.E, AMS III.H, AM0009, AM0013, AM0025, AM0056, AM0028, AM0029, AM0008)		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, 4.1, 13.1)		
Reviewed by	Shreya Garg	Date	13/12/2018
Approved by	Anshika Gupta	Date	13/12/2018

Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	7 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	**Date**	01/03/2018
Approved by	Ashok Gautam	**Date**	01/03/2018

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
GEDA	Gujarat Energy Development Agency
PP	Project Participant

APPENDIX 5: METER CALIBRATION DETAILS

The Energy Meters details used for the respective SPV are tabulated below:

Name of the SPVs	Site	Capacity (MW)	Main Meter Details	Check Meter Details	Calibration Date[4]	Due date
Azure Power Jupiter Pvt Ltd	Hardoi	20	SL. No. : UP-0015E[5] Make: EDMI Accuracy class: 0.2 s	SL. No. : UP-0015E[6] Make: EDMI Accuracy class: 0.2 s	19-September-2017	29-February-2024
			SL. No. : UP-0202-A Make: L&T Accuracy class: 0.2 s	SL. No. : UP-0203-A Make: L&T Accuracy class: 0.2 s	01-March-2019	
	Hamirpur	10	SL. No. : 0015197361 Make: L&T Accuracy class: 0.2 s	SL. No.: UP-0008-A Make: L&T Accuracy class: 0.2 s	22-September -2017	21-September -2021
Azure Power Thirty Seven Pvt Ltd	Rachu, Marchal and Veljal	100	SL. No.: APZ00498 Make: Secure Accuracy class: 0.2 s	SL. No.: APZ00499 Make: Secure Accuracy class: 0.2 s	12-January-2018	11-January-2023
Azure Power Venus Pvt Ltd	Dakore	40	**Aata Substation Circuit-I** Main Meter SL. No.: UP3383A Make: Secure Accuracy class: 0.2 s **Aata Substation Circuit-II**	**Aata Substation Circuit-I** Check Meter: SL. No.: UP3384A Make: Secure Accuracy class: 0.2 s **Aata Substation Circuit-II**	01-December-2018	30-November-2023

[4] As Project is greenfield, meters installed for all SPVs were precalibrated.

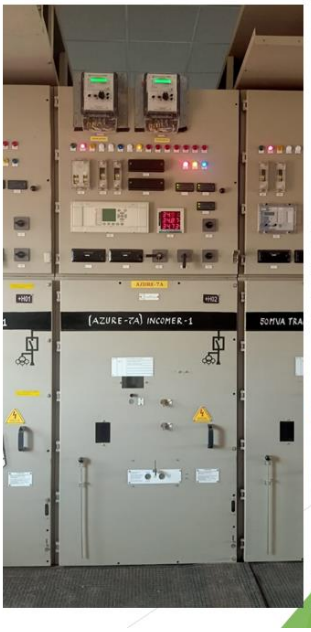
[5] Meter change on 01-03-2019 for both main and check meter

[6] Meter change on 01-03-2019 for both main and check meter

Name of the SPVs	Site	Capacity (MW)	Main Meter Details	Check Meter Details	Calibration Date[4]	Due date
			Main Meter: SL. No : UP3381A Make: Secure Accuracy class: 0.2 s	Check Meter: SL. No: UP3382A Make: Secure Accuracy class: 0.2 s		
Azure Power Thirty Six Pvt Ltd	Anantppuram	50	SL. No. : APZ00507 Make: Secure Accuracy class: 0.2 s	SL. No: APZ00508 Make: Secure Accuracy class: 0.2 s	28-April-2018	27-April-2023
Azure Power Thirty Three Pvt Ltd	Dhari	35	SL. No.: GJ-3977-A Make: EDMI Accuracy class: 0.2 s	SL. No: GJ-3979-A Make: EDMI Accuracy class: 0.2 s	02-November-2018	01-November-2023
	Semaliya	30	SL. No. : GJ-4049-A Make: EDMI Accuracy class: 0.2 s	SL. No: GJ-4050-A Make: EDMI Accuracy class: 0.2 s	10-December-2018	09-December-2023
	Vadol	40	SL. No. : GJ-3980-A Make: EDMI Accuracy class: 0.2 s	SL. No: GJ-3981-A Make: EDMI Accuracy class: 0.2 s	01-November-2018	31-October-2023
	Netramali	40	SL. No: GJ-4095-A Make: EDMI Accuracy class: 0.2 s	SL. No.: GJ-4096-A Make: EDMI Accuracy class: 0.2 s	07-March-2019	06-March-2024
	Sanes	50	SL. No.: GJ-4145-A Make: EDMI Accuracy class: 0.2 s	SL. No : GJ-4146-A Make: EDMI Accuracy class: 0.2 s	13-March-2019	12-March-2024
	Muloj	40	SL. No.: GJ-4093-A Make: EDMI Accuracy class: 0.2 s	SL. No :GJ-4094-A Make: EDMI Accuracy class: 0.2 s	22-February-2019	21-February-2024
	Vartol	25	SL. No.: GJ-4047-A Make: EDMI Accuracy class: 0.2 s	SL. No: GJ-4048-A Make: EDMI Accuracy class: 0.2 s	09-March-2019	08-March-2024

APPENDIX 6: REMOTE AUDIT SNAPS AND SITE PHOTOGRAPHS

Azure Power
AZURE POWER VENUS PVT. LTD.
Solar Power PV Project
Capacity : 40MW (U.P-3)
Location : Village - Dakore
Tahsil, Orai (Dist.Jalaun) U.P.- 285122
U.P.N.E.D.A.

SIDE OFFICE

PSS METERING POINT