

BUNDLED WIND POWER PROJECT BY GIRIRAJ ENTERPRISES



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Summary:

Verification purpose: The purpose of the project activity is to generate electrical energy using renewable energy source (wind) for the purpose of sale to grid. The project activity generates electricity using wind potential and converts it into kinetic energy using Wind turbines, which drives the alternators to generate energy. The project “Bundled Wind Power Project by Giriraj Enterprises” is a bundled VCS project which involves installation, commissioning and operation of multiple Wind Power Projects at different locations in the Indian states of Gujarat and Madhya Pradesh. The proposed total installed capacity was 112.5 MW by operation of 75 Wind Turbine Generators (WTGs) of 1.5 MW each at the time of registration. However, now the capacity of the project has been downsized to 96 MW with operation of 64 WTGs due to non-commissioning of some WTGs at Gujarat sites. The electricity generated by the wind projects will be supplied to regional electrical grid which will be part of the NEWNE grid of India. As the project involves power generation through renewable sources of energy, it will result in emission reductions due to displacement of grid electricity which is majorly fossil fuel based.

The power produced displaces an equivalent amount of power from the grid, which is fed mainly by fossil fuel fired power plants. Hence, as per registered JOINT VCS PD & MR, it results in reduction of GHG emissions. GHG emission reductions from the project activity will be 218,910 tons of CO₂e per year and total GHG emission reductions for the chosen 10 year crediting period will be 2,189,100 tons of CO₂e.

The project is registered with VCS with Project ID 1669¹. Start date of the project activity is the 31/03/2015. The monitoring period for this VCS verification is chosen from 01/03/2017 to 31/03/2018 (including both days) and the project activity achieved **166,680** tCO₂e emission reductions during this monitoring period.

A risk based approach has been followed to perform this verification activity. In the course of verification, 04 Corrective Action request (CAR) and 00 Clarification Requests (CLs) were raised and successfully closed & No FAR was raised. The review of the Monitoring report and additional

¹ http://www.vcsprojectdatabase.org/#!/project_details/1669

documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided *LGA/ Technological Center S.A. (Applus+ Certification)* with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (*Applus+ Certification*) has been appointed by “Giriraj Enterprises” to perform the 2nd periodic VCS verification of the “Bundled Wind Power Project by Giriraj Enterprises” under VCS standard and guideline version 3.7. The objective of this verification activity is to have an independent third party for the assessment of the project design, Monitoring report and Final Validation report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against “ACM0002 - Version 17.0”
- the project's monitoring plan is assessed against “ACM0002 - Version 17.0”
- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM validation and verification standard for project activities Version 01.0
- CDM project standard for project activities Version 01.0
- CDM project cycle procedure for project activities Version 01.0
- VCS standard v3.7
- VCS guideline v3.7

Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified emission reductions (VERs).

1.2 Scope and Criteria

The scope of the verification is the independent and objective review of the Monitoring report (MR). The MR is reviewed against the relevant criteria (see 1.1) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The verification was based on the guidance given in the CDM validation and verification standard for project activities Version 01.0, JOINT VCS PD & MR Version 02 dated 28/03/2017 and JOINT VALIDATION & VERIFICATION REPORT Version 01 dated 30/03/2017, CDM project standard for project activities Version 01.0, CDM project cycle procedure for project activities Version 01.0 and VCS guideline and standard version 3.7.

The audit team has employed a risk based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the MR. The main focus of the audit team is to identify the significant risks for the project implementation and the generation of VERs. The verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring report combined.

The only purpose of the verification is its usage during the issuance process as part of the VCS project cycle. Therefore, LGAI Technological Center S.A. (Applus+ Certification) can't be held liable by any party for decisions made or not made based on the verification opinion, which will go beyond that purpose.

1.3 Level of Assurance

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for site visit or document verifications. The entire documents checked/WTGs verification conducted to arrive at positive verification conclusions.

1.4 Summary Description of the Project

The project "Bundled Wind Power Project by Giriraj Enterprises" is a bundled VCS project which involves installation, commissioning and operation of multiple Wind Power Projects at different locations in the Indian states of Gujarat and Madhya Pradesh. The proposed total installed capacity was 112.5 MW by operation of 75 Wind Turbine Generators (WTGs) of 1.5 MW each at the time of registration. However, now the capacity of the project has been downsized to 96 MW with operation of 64 WTGs due to non-commissioning of some WTGs at Gujarat sites. The electricity generated by the wind projects will be supplied to regional electrical grid which will be part of the NEWNE grid of India. As the project involves power generation through renewable sources of energy, it will result in emission reductions due to displacement of grid electricity which is majorly fossil fuel based.

The power produced displaces an equivalent amount of power from the grid, which is fed mainly by fossil fuel fired power plants. Hence, as per JOINT VCS PD & MR, it results in reduction of GHG emissions. GHG emission reductions from the project activity, estimated in 218,910 tons of CO₂e per year and total GHG emission reductions for the chosen 10 year crediting period will be 2,189,100 tons of CO₂e.

The project is registered with VCS with Project ID 1669. Start date of the project activity is the 31/03/2015. The monitoring period for this VCS verification is chosen from 01/03/2017 to 31/03/2018 (including both days) and the project activity achieved **166,680** tCO₂e emission reductions during this monitoring period.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification Scope: The scope is defined as an independent and objective review of the Monitoring report (MR) prepared as per the registered JOINT VCS PD & MR and registered approved methodology ACM0002 - Version 17.0. The MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard and guideline version 3.7, including the approved baseline and monitoring methodology ACM0002 - Version 17.0. The verification was based on the requirements in the CDM validation and verification standard for project activities Version 01.0, CDM project standard for project activities Version 01.0, CDM project cycle procedure for project activities Version 01.0 and VCS guideline and standard version 3.7.

The verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the Monitoring report.

Verification Process: The project assessment is based on the CDM validation and verification standard for project activities Version 01.0 and VCS standard and guideline version 3.7 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

Once the project is received by the audit team, the members of the audit team carried out:

1. A desk review of the Monitoring report against the registered JOINT VCS PD & MR and final Joint Validation & Verification report;
2. Follow-up interviews with project participant;
3. The resolution of outstanding issues and the issuance of the final verification report and opinion.

The prepared verification report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the VCS executive board.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. LGAI Technological Center S.A. (Applus+ Certification) has developed a specific checklist customized for the project. The checklist demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the audit team, and the results from validating the identified criteria.

The verification checklist consists of three tables. The different columns in these tables are described in the tables below:

Verification Checklist Table 1: Mandatory Requirements			
Requirement	Reference	Conclusion	Cross reference
The requirements which the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the draft verification report.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is verified. This is to ensure a transparent verification process.

Verification Checklist Table 2: Requirement checklist				
Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organized in several different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	Conclusions are presented based on the assessment of the first MR version. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification is used when the audit team has identified a need for further clarification. Forward action request to highlight issues related to project implementation that requires review during the further verifications.	Conclusions are presented in the same manner based on the assessment of the final MR version and further documents including assumptions presented in the documentation.

Verification Checklist Table 3: Resolution of Corrective Action and Clarification Requests				
Draft report clarifications and corrective action requests	Ref. to checklist question in table 1&2	Summary of project owner response	Validation/Verification conclusion	
If the conclusions from the draft verification are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 1&2 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the audit team should be summarized in this section.	This section should summarize the audit team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".	

Appointment of the audit team

Appointment of the audit team According to the sectoral scope / technical area and experience in the sectoral or national business environment, LGAI Technological Center, S.A. (Applus+ Certification) has composed a project audit team in accordance with the appointment rules in the internal Quality Management System of LGAI Technological Center, S.A. (Applus+ Certification). The composition of

audit team shall be approved by the LGAI Technological Center, S.A. (Applus+ Certification) ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT).
- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies is covered by the audit team.

Selection of Audit team as below:

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Dr. Atul Takarkhede	LA/TE	YES	YES	YES	YES
Mr. Simon Shen	TR	YES	YES	NA	NA

The detail regarding the audit team is provided below in this report as Appendix 3

Document review

The Monitoring report submitted by the Client was reviewed against the approved methodology, JOINT VCS PD & MR Version 02 dated 28/03/2017 and JOINT VALIDATION & VERIFICATION REPORT Version 01 dated 30/03/2017 and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in this report below in appendix 1.

Follow-up interviews

A site visit is conducted by LGAI Technological Center S.A. (Applus+ Certification) performed interviews, telephone conferences, and physical site inspection with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in this report in Section 2.3.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for LGAI Technological Center S.A. (Applus+ Certification)'s positive conclusion on the Monitoring report. The Corrective Action Requests raised by LGAI Technological Center S.A. (Applus+ Certification) were resolved during communications between the Client and LGAI Technological Center S.A. (Applus+ Certification) to guarantee the transparency of the verification process, the concerns raised and responses given are summarized below in the appendix 2.

The final MR Version 2 submitted by PP on 23/06/2018 serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

As final step of a verification of the final documentation including the verification report and the checklist have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the audit team approval can only be given by the other one to avoid any conflict of Interest.

After confirmation of the PP the positive verification opinion and relevant documents are submitted to the VCS board through the VCS web-platform.

2.2 Document Review

The details of the document observed during the verification process are listed below in Appendix 1 of this report.

2.3 Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Bankar	Mr. Kailash	PP Representative	18/05/2018	Implementation of the project, monitoring and emission reduction calculations	Dr. Atul Takarkhede
2.	Patel	Subhash	O&M Personel			
3.	Das	Kingshuk	Project Manager-EKI		monitoring report and emission reduction calculations	
4.	Patil	Ramkrishna	GM-EKI			

2.4 Site Inspections

Duration of on-site inspection: 18/05/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	Audit team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring. Audit team also checked that whether the monitoring plan as described in the registered JOINT VCS PD & MR is actually practised onsite. Also audit team checked any change in host country criteria which may affect the baseline of the project activity.	MP & Gujarat, India	18/05/2018	Dr. Atul Takarkhede

2.5 Resolution of Findings

The objective of this phase of the Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues from validation which need to be clarified for LGAI Technological Center S.A. (Applus+ Certification)'s positive conclusion on the Monitoring report. The Corrective Action Requests raised by LGAI Technological Center S.A. (Applus+ Certification) were resolved during communications between the Client and LGAI Technological Center S.A. (Applus+ Certification) to guarantee the transparency of the verification process, the concerns raised and responses given are summarized below in the appendix 2.

The final MR Version 2 submitted by PP on 23/06/2018 serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	00	00	00
Description of project activity	00	02	00
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	00	00	00
- Deviation from methodology	00	00	00
- Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
- Project boundary	00	00	00
- Establishment and description of baseline scenario	00	00	00
- Demonstration of additionality	00	01	00
- Emission reductions	00	01	00
- Calibration details	00	00	00
- Monitoring plan	00	00	00
Others (please specify)	00	00	00
Total	00	04	00

The list of findings and their resolution is presented in Appendix 2 of this report.

2.5.1 Forward Action Requests

This is 2nd periodic VCS verification of the project activity and No FAR open from Joint VCS Validation & 1st VCS verification.

2.6 Eligibility for Validation Activities

This section is not applicable as the project has undergone verification only.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project is not applied under any other GHG program like CDM, GS, hence not applicable.

3.2 Methodology Deviations

Not applicable.

3.3 Project Description Deviations

At the time of registration, the total capacity of the project activity was 112.5 MW. However, the same has been downsized to 96 MW due to;

- 13.5 MW capacity wind project by Giriraj Enterprises at Vejalpar site, Gujarat has been downsized to capacity of 12.0 MW.
- 15 MW capacity wind project by Giriraj Enterprises at Khareda site, Gujarat has been cancelled by the PP and has not been commissioned.

As the total capacity of the project activity has been downsized, there is deviation of project description only. Assessment team confirms that due to the downsizing of the project capacity, there is no change in the applied methodology or the tools.

Impact on Additionality due to downsizing of project capacity

IRR for 13.5 MW capacity wind project at Vejalpar site, Gujarat at the time of investment decision making was 6.92% and the benchmark was 15.43%. Same was checked with registered VCS PD & MR. The verification team checked the IRR calculation sheet with 12.0 MW capacity submitted by the project proponent. IRR for the downsized capacity of 12.0 MW comes to be 6.80% and the benchmark is 15.43%. Thus verification team confirms that after downsizing of the 13.5 MW project to 12.0 MW, the equity IRR is below the benchmark value. Hence, there is no impact on the project additionality.

Also, at the time of registration, 15.0 MW project was considered. But the project was cancelled and the entire capacity did not get commissioned. Hence, this will also not have any impact on the project additionality.

As the downsizing of the project activity does not have impact on scale & methodology of the project activity, additionality of the project activity with downsized capacity and will not lead overestimation of ER value, hence deviation is accepted by the audit team.

3.4 Grouped Project

Not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity, “Bundled Wind Power Project by Giriraj Enterprises” was registered as a VCS project on 28/03/2017 applying the methodology ACM0002 - Version 17.0. The WTGs of the project activity are owned by the Project Proponent, i.e. Giriraj Enterprises, which was verified from commissioning certificate and the PPA for the project activity.

The project activity involves the installation of Wind Power Projects. The total installed capacity of the project is 96 MW; which involves operation of 64 Wind Turbine Generators (WTGs) in Madhya Pradesh and Gujarat states of India. The details of the project is given below:

Sr. No.	Project Capacity (in MW)	Owner of Project	Project Location	State
1	30 MW	Giriraj Enterprises	Hatuniya Site, Mandsaur	Madhya Pradesh
2	22.5 MW	Giriraj Enterprises	Dewas Site, Dewas	Madhya Pradesh
3	21 MW	Giriraj Enterprises	Dhar Site, Dhar	Madhya Pradesh
4	12.0 MW	Giriraj Enterprises	Vejalpar Site, Morbi	Gujarat
5	10.5 MW	Giriraj Enterprises	Vejalpar Site, Morbi	Gujarat

The Geo Coordinates of the project location has been mentioned in the table below

S. No.	Machine ID	Village	Taluka	District	State	Latitude	Longitude
1	RISPL/1500/16-17/4049	Kumbhariya	Morbi	Morbi	Gujarat	23° 07' 38.4492"	76° 56' 49.0040"
2	RISPL/1500/16-17/4050					23° 08' 13.4232"	76° 56' 36.1521"
3	RISPL/1500/16-17/4051					23° 08' 05.4420"	76° 56' 53.2250"
4	RISPL/1500/16-17/4052					23° 07' 58.2384"	76° 58' 13.4000"
5	RISPL/1500/16-17/4053					23° 07' 52.4352"	76° 56' 48.2921"
6	RISPL/1500/16-17/4054					23° 08' 04.5960"	76° 57' 58.8007"
7	RISPL/1500/16-17/4055					23° 07' 28.3728"	76° 57' 54.4416"
8	RISPL/1500/16-17/4542	Khakhrechi	Maliya	Morbi	Gujarat	23° 04' 36.4872"	76° 53' 03.0658"
9	RISPL/1500/16-17/4543					23° 05' 11.8644"	76° 53' 04.9294"
10	RISPL/1500/16-17/4544					23° 05' 13.9056"	76° 52' 46.5106"
11	RISPL/1500/16-17/4545					23° 05' 00.0420"	76° 52' 42.3122"
12	RISPL/1500/16-17/4546					23° 04' 41.2320"	76° 52' 49.2536"
13	RISPL/1500/16-17/4547					23° 05' 07.5228"	76° 53' 19.9076"
14	RISPL/1500/16-17/4548					23° 04' 35.1336"	76° 53' 53.5708"
15	RISPL/1500/16-17/4549					23° 05' 18.3840"	76° 53' 57.6920"
16	RH3- 01	Ratikhedi	Mandsaur	Mandsaur	Madhya Pradesh	23° 53' 55.3848"	81° 14' 00.4539"
17	RH3- 02	Bholiya	Mandsaur	Mandsaur		23° 52' 51.1176"	81° 13' 50.1898"
18	RH3- 03	Ratikhedi	Mandsaur	Mandsaur		23° 53' 15.6300"	81° 13' 52.2136"
19	RH3- 04	Ratikhedi	Mandsaur	Mandsaur		23° 53' 45.4092"	81° 14' 18.1189"
20	RH3- 05	Ratikhedi	Mandsaur	Mandsaur		23° 53' 50.4636"	81° 14' 08.8622"
21	RH3- 06	Kankarwa	Jaora	Ratlam		23° 51' 36.6264"	81° 13' 46.2748"
22	RH3- 07	Bholiya	Mandsaur	Mandsaur		23° 52' 34.2552"	81° 14' 02.0410"
23	RH3- 08	Kankarwa	Jaora	Ratlam		23° 51' 31.3164"	81° 13' 54.2911"
24	RH3- 09	Bholiya	Mandsaur	Mandsaur		23° 52' 05.6028"	81° 13' 22.5297"
25	RH3- 10	Bholiya	Mandsaur	Mandsaur		23° 51' 57.0204"	81° 13' 20.6057"
26	RH4- 01	Jogikheda	Mandsaur	Mandsaur		23° 55' 44.0760"	81° 13' 01.3611"
27	RH4- 02	Ratikhedi	Mandsaur	Mandsaur		23° 54' 41.4036"	81° 13' 35.2470"
28	RH4- 03	Kuchdod	Mandsaur	Mandsaur		23° 54' 29.5380"	81° 14' 57.4242"

S. No	Machine ID	Village	Taluka	District	State	Latitude	Longitude
29	RH4- 04	Khajuri Anjana	Mandsaur	Mandsaur		23° 55' 26.4576"	81° 13' 22.4496"
30	RH4- 05	Ratikhedi	Mandsaur	Mandsaur		23° 54' 32.5872"	81° 13' 38.4149"
31	RH4- 06	Khajuri Anjana	Mandsaur	Mandsaur		23° 55' 36.1776"	81° 13' 23.8105"
32	RH4- 07	Khajuri Anjana	Mandsaur	Mandsaur		23° 55' 31.0548"	81° 14' 19.1617"
33	RH4- 08	Khajuri Anjana	Mandsaur	Mandsaur		23° 55' 18.7068"	81° 13' 29.2986"
34	RH4- 09	Khajuri Anjana	Mandsaur	Mandsaur		23° 54' 41.8464"	81° 14' 45.3159"
35	RH4- 10	Kuchdod	Mandsaur	Mandsaur		23° 54' 33.3612"	81° 14' 45.5120"
36	TK- 01	Bhoj Pura	Tonk Khurd	Dewas	Madhya Pradesh	23° 05' 00.6252"	82° 15' 42.1007"
37	TK- 04	Bhoj Pura				23° 05' 31.8588"	82° 15' 39.8266"
38	TK- 05	Bhoj Pura				23° 05' 44.5272"	82° 15' 37.3439"
39	TK- 06	Bhoj Pura				23° 05' 53.0052"	82° 15' 38.1612"
40	TK- 07	Bhoj Pura				23° 06' 01.4472"	82° 15' 39.4702"
41	TK- 08	Bhoj Pura				23° 06' 09.8568"	82° 15' 40.9898"
42	TK- 09	Devli				23° 06' 18.1944"	82° 15' 39.5913"
43	TK- 10	Devli				23° 06' 30.4740"	82° 15' 44.6623"
44	TK- 12	Ranayal Kala				23° 06' 42.4404"	82° 16' 05.0565"
45	TK- 14	Ranayal Kala				23° 07' 11.2584"	82° 15' 35.2710"
46	TK- 02	Bhoj Pura				23° 05' 06.8244"	82° 15' 27.0816"
47	TK- 13	Ranayal Kala				23° 07' 03.6336"	82° 16' 05.7477"
48	TK- 15	Sankely				23° 06' 55.4580"	82° 16' 35.7260"
49	TK- 16	Sankely				23° 07' 22.2060"	82° 16' 04.9380"
50	TK- 17	Sankely				23° 07' 33.5352"	82° 15' 59.0681"
51	TIR- 04	Labrawada	Dhar	Dhar	Madhya Pradesh	22° 38' 02.7636"	81° 15' 53.0078"
52	TIR- 05	Navgaon				22° 38' 26.1024"	81° 16' 18.3134"
53	TIR- 07	Kalukhedi				22° 38' 30.7356"	81° 16' 10.4044"
54	TIR- 09	Kalukhedi				22° 38' 36.6648"	81° 16' 03.5137"
55	TIR- 10	Chikliya				22° 37' 52.0104"	81° 15' 46.2258"
56	TIR- 03	Navgaon				22° 37' 59.3724"	81° 16' 16.6493"
57	TIR- 06	Navgaon				22° 38' 09.5820"	81° 16' 19.5422"
58	TIR- 12	Navgaon				22° 39' 03.8196"	81° 17' 01.1698"
59	TIR- 13	Navgaon				22° 39' 03.6072"	81° 17' 28.7447"
60	TIR- 14	Navgaon				22° 37' 52.8528"	81° 16' 25.5701"
61	ADD- 02	Navgaon				22° 37' 50.0016"	81° 16' 57.2696"
62	ADD- 03	Navgaon				22° 38' 26.7720"	81° 17' 03.4761"
63	ADD- 04	Navgaon				22° 38' 37.4388"	81° 17' 03.6032"
64	ADD- 05	Khilchipura				22° 38' 55.9428"	81° 17' 41.4823"

The ex-ante fixed grid emission factor of 0.9777 tCO₂/MWh has been used for the baseline emission calculation which is line with the registered JOINT VCS PD & MR.

By comparing the actual ER claimed in this monitoring period with the estimate in the registered JOINT VCS PD & MR (199,939 tCO₂e for the monitoring period estimated for 96 MW), the actual emission reductions (166,680 tCO₂e for the monitoring period for 96 MW) are lower than the estimated ERs by 17% in comparison with what is stated in the registered JOINT VCS PD & MR which surely will not lead to the overestimation of VERs.

The audit team confirmed that there is no proposed or actual change to the project design during this monitoring period except downsize of capacity.

All required equipments and procedures are available and implemented in an appropriate manner.

It was observed that the monitoring plan was implemented as per the requirement of the registered JOINT VCS PD & MR, Final Joint Validation & Verification Report and approved methodology ACM0002 - Version 17.0. The organisational role and responsibility as mentioned in the registered JOINT VCS PD &

MR is followed onsite. Error factor was applied to the monitoring equipment which was not calibrated as per the specified interval in the registered JOINT VCS PD & MR. All the emergency preparedness as mentioned in the JOINT VCS PD & MR is followed onsite and no discrepancies were found regarding the same.

Start date of the project activity is 31/03/2015. The audit team observed that the project is in line with the registered JOINT VCS PD & MR, FVR (which comprises previous verification) and approved methodology. CAR 01, CAR 02 & CAR 03 were raised for editorial mistake in MR & VCS declaration. CARs were successfully closed by appropriate corrections in revised MR & Declaration.

4.2 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 JOINT VCS PD & 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 JOINT VCS PD & MR
Findings	CAR 04 was raised during the verification. The description of the CAR and its closure is described below in Appendix 2 of this report.
Conclusion	Ex-ante Parameter: $EF_{grid,CM,y}$ = Parameter is fixed ex-ante for the entire crediting period and as per the validated JOINT VCS PD & MR same is fixed 0.9777 tCO₂/MWh. Verification team found same was used in the ER calculations. Baseline Emissions: The baseline Emissions for a given year are calculated by multiplying the energy baseline with the grid emission factor. The grid in this case would be the 'Indian Grid' Formula Used:- $BE_y = EGP_{J,y} * EF_{grid,CM,y} \quad (1)$ Where: BE_y: Baseline emissions in year y (tCO₂e/yr) $EGP_{J,y}$: 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) $EF_{grid,CM,y}$: Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO₂e/MWh) $EGP_{J,y}$ = The verification team has checked the entire monthly JMR reports for net electricity generated & supplied to the grid and crosschecked same with the invoices 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 registered JOINT VCS PD & MR. 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 17.0, 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 project emissions (PE_y) are taken as zero. Leakage: As per ACM0002 - Version 17.0, Leakage emissions are not considered for the project activity.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log for the monitoring period. During the verification site visit the feeder wise location of the WTGs is also checked. The Calibration details of the monitoring meters are also checked with calibration certificates.
Findings	No finding raised on the issue.
Conclusion	The metering arrangement is tri-vector bi-directional energy meters of Secure Make; accuracy class 0.2s (main and check) at the State Electricity Board (SEB) substation. For measuring the energy delivered by the project activity, one set of main meters (part of interconnection facilities) and check meters are provided at each feeder by the project proponent and respective electricity distribution company. These meters record several parameters including electricity exported & imported. These electricity meters are being used by state electricity board for JMR (Joint Meter Reading) electricity generation statements. During commissioning of the WTGs monitoring meters of accuracy class i.e. 0.2s were installed. The meters are monitored continuously & cumulative readings are taken at the end of the month by joint meter reading procedure. These are sealed by State Utilities to avoid malfunctioning with meter readings. Calibration frequency of the monitoring meters is once in 5 years. However, Meters are calibrated by the meter testing division of the state utility in the presence of O&M Contractor / investor's representatives and State Utilities officials to ensure the working of meter within permissible limits, however, calibration frequency and schedule is under the complete discretion of State Utility and PP do not have control on it. The calculation of net electricity supplied to grid is under purview of state electricity board and PP does not have control on it. Calibration details of the monitoring meters checked with calibration certificates submitted by PP and found that calibration frequency of once in 5 years is not complied for all monitoring meters. However, delayed calibration was observed for 22.5 MW Dewas Site, Madhya Pradesh site WTGs, hence maximum error factor i.e. maximum permissible limit is applied for March 2017 to Dec 2017 for 22.5 MW Dewas Site, Madhya Pradesh WTGs. In India State Utilities are owned by respective State Government and have their own working practices. Hence the verification team accepted the conservative approach of ER calculations. The break down log is checked and there is no major breakdown during the monitoring period. No unforced error observed.

4.4 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	
1.	Not applicable	Not applicable	Not applicable	Not applicable

5 SAFEGUARDS

5.1 No Net Harm

No potential environment or socio economic matter was found during the site visit. The project is renewable energy project and thus no negative impact observed in Air or water quality onsite. Being renewable power source and no environmental emissions involved, Wind projects are exempted from Environmental Impact Assessment (EIA) studies and environmental clearance vide EIA Notification 2006

(SO S.O. 1533 dtd. 14/09/2006²) & amendments thereof issued by Ministry of Environment, Forest & Climate Change (MoEFCC).

5.2 Local Stakeholder Consultation

All the stakeholders are happy with the implementation and operation of the project activity and no negative comments envisaged for the project activity. There was no change in project description form the registered JOINT VCS PD & MR except downsize of the project activity. Local persons were given employment in security & maintenance work. Audit team confirmed the same during the verification site visit by interviews of some local persons. Same is presented in below table;

Name	Mr. Subhash Patel
Occupation	O&M Personnel (Vejalpar Site)
Question: Whether local peoples are given employment?	
Ans: Yes. Locals are employed in O&M work as well as unskilled peoples in security & labour work.	
Question: Does project have any adverse impact in the area?	
Ans: No. There are no any adverse impacts. We are happy due to project implementation.	

6 VERIFICATION CONCLUSION

LGAI Technological Center S.A. (Applus+ Certification) has been engaged by Giriraj Enterprises to perform the 2nd periodical verification of the “Bundled Wind Power Project by Giriraj Enterprises”.

The Giriraj Enterprises is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project’s Monitoring Plan in the registered JOINT VCS PD & MR and the applied methodology ACM0002 - Version 17.0.

Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is operated as planned and described in the project document;
- the monitoring plan is as per the applied methodology;
- the monitoring process in Monitoring Report is as per the JOINT VCS PD & MR;
- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.

² envfor.nic.in/legis/eia/so1533.pdf

Verification period: 01/03/2017 to 31/03/2018 (including both days)

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2017	128,193	0	0	128,193
2018	38,487	0	0	38,487
Total	166,680	0	0	166,680

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED (VERIFICATION)

No.	Author	Title	References to the document	Provider
1.	NA	Commissioning certificates of the WTGs implemented in the project site.	NA	Project participant
2.	NA	Contract of the project participant with the DOE	Contract document signed between PP and DOE	Project participant
3.	NA	Technical specifications of wind turbine generators from manufacturers	Manufacturer technical specifications	Project participant
4.	NA	Power Purchase agreement for the project activity	NA	Project participant
5.	NA	JOINT VCS PD & MR	Version 02 dated 28/03/2017	Project participant
6.	NA	JOINT VALIDATION & VERIFICATION REPORT	version 01 dated 30/03/2017	Project participant
7.	NA	Ministry of Environment and forest: www.envfor.nic.in UNFCCC: www.cdm.unfccc.int CEA: Central electricity authority: www.cea.nic.in VCS: Verified Carbon Standard: www.v-c-s.org	Reference link is provided.	Independent Search
8.	NA	Tools/ guidelines used in the project activity - CDM Methodology ACM0002 - Version 17.0 - Tool to determine the remaining lifetime of the project activity in line with Annex 15 EB 50 - Tool to calculate the emission factor for an electricity system - Version 05.0 - Glossary of CDM terms version 07 - VCS verification report template version 03.4	UNFCCC CDM web site	UNFCCC
9.	NA	JMR records for the complete monitoring period	JMR records	Project participant
10.	NA	MR version 1 MR version 2	03/05/2018 23/06/2018	Project participant
11.	NA	Emission Calculation sheet version 01 Emission Calculation sheet version 02	03/05/2018 23/06/2018	Project participant
12.	NA	EF & ER Estimation Calculation sheet Version 02	28/03/2017	Project participant
13.	NA	Invoices for the complete monitoring period	Invoice	Project participant
14.	NA	Break down details of the complete monitoring period	Log sheet	Project participant
15.	NA	Self-Declaration from PP for not participating/claiming other emission reduction programme	Declaration	Project participant

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

VERIFICATION FINDINGS

Project Implementation Status

CAR ID	01	Section no.	VCS MR	Date: 10/06/2018
Description of CAR				
MR not consistent about inclusion of first & last days of monitoring period.				
Project participant response				Date: 23/06/2018
Inclusion of first and last days of the monitoring period is now made consistent throughout the VCS MR, version-2.				
Documentation provided by project participant				
VCS MR, version-2				
DOE assessment				Date: 30/06/2018
Now MR revised for inclusion of first & last days of monitoring period. CAR closed.				

CAR ID	02	Section no.	1.7 of VCS MR	Date: 10/06/2018
Description of CAR				
Geo-coordinates of the WTGs are not expressed in Degree Minutes formats. Corrections requested.				
Project participant response				Date: 23/06/2018
The geo-coordinates of the WTGs are now changed to degree minute format in the VCS MR, version-2				
Documentation provided by project participant				
VCS MR, version-2				
DOE assessment				Date: 30/06/2018
Geo-coordinates are now expressed in Degree Minutes formats and found correct. CAR closed.				

CAR ID	03	Section no.	2.2.2 of VCS MR	Date: 10/06/2018
Description of CAR				
Impact of downsizing on the additionality of the project activity is missing in the section. Corrections requested.				
Project participant response				Date: 23/06/2018
The impact of downsizing on additionality of the project is now explained in the section 2.2.2 of the VCS MR, version-2.				
Documentation provided by project participant				
VCS MR, version-2				
DOE assessment				Date: 30/06/2018
Revised IRR sheet has been provided by PP. It is observed that there is no impact of downsizing of capacity in additionality. CAR closed.				

Accuracy of GHG Emission Reduction and Removal Calculations

CAR ID	04	Section no.	3.2 & 4.1 of MR	Date: 10/06/2018
Description of CAR				
Value of (Quantity of net electricity generation supplied by the project) $EG_{PJ,y}$ is not matching with ER sheet. Appropriate corrections requested in respective sections of MR.				
Project participant response				Date: 23/06/2018
The inconsistency is now corrected throughout the VCS MR, version-2				
Documentation provided by project participant				
VCS MR, version-2				
DOE assessment				Date: 30/06/2018
Value of $EG_{PJ,y}$ is now corrected and found in line with JMR & invoices. CAR closed.				

Quality of Evidence to Determine GHG Emission Reductions and Removals

CAR ID		Section no.		Date:
Description of CAR				
NA				
Project participant response				Date:
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date:
NA				

FAR ID		Section no.		Date:
Description of FAR				
NA				
Project participant response				Date:
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date:
NA				

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Lead Auditor/ Technical Expert	OR	Takarkhede	Dr. Atul	TQC- Outsourced entity	Yes	Yes	Yes	Yes

Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (TR)	EI	Shen	Simon	LGAI Technological Center S.A. (Applus+ Certification)
2.	Approver	IR	Sendin	Juan	LGAI Technological Center S.A. (Applus+ Certification) B.U. Managing Director

Short CVs of the Team:

1. Dr. Atul Takarkhede counts with 9 years of experience in field of Environmental Auditing, consulting and accreditation. He is an Expert in ISO 9001-14001, CO₂/GHG Reporting, Carbon Foot Print, Energy, Water and Waste Management Reporting for organizations environmental performance. His professional portfolio is mainly related with carrying out EIA, conducting QA/QC of EIA Reports; Conducting Environmental/water Audits; NABET requirements appliance. Furthermore, he counts with solid experience on CDM-VCS-GS consultancy and auditing. He has Ph.D. (Environmental Science) from Institute of Science, RTM Nagpur University, Nagpur, and he has already published different technical reports related to environmental science.
2. Meng (Simon) Shen (Master Degree in Thermal Energy Engineering, Bachelor Degree in Environmental Engineering) is a Lead Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based in Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ LGAI, he had been worked for TÜV SÜD as a GHG Validator/Assessment team and ISO 9001/14001 Lead Auditor for 3.5 years.

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 ₂ e	Carbon dioxide equivalent
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)
JMR	Joint Metering reading
PP	Project Participant

APPENDIX 5: CALIBRATION DETAILS OF THE METERS**22.5 MW Dewas Site, Madhya Pradesh**

Feeder 1 having 7 WTGs of 1.5 MW each and Feeder 2 having 8 WTGs of 1.5 MW each.

Feeder Details	Capacity	Meter serial number	Accuracy class	Make	Date Of Calibration ³
Prisma Feeder 1 (Dewas)	10.5 MW	XD500621 Main	0.2s	Secure	08/12/2017
		XD500620 Check			
Prisma Feeder 2 (Dewas)	12 MW	XD500619 Main	0.2s	Secure	08/12/2017
		XD500622 Check			

21 MW Dhar Site, Madhya Pradesh

One Feeder having 5 WTGs of 1.5 MW each and another Feeder having 9 WTGs of 1.5 MW each.

Feeder Details	Capacity	Meter serial number	Accuracy class	Make	Date Of Calibration ⁴
Tirupati Dhar Renewable Power Pvt. Ltd (Jaitpura)	13.5 MW	XD500605 Main	0.2s	Secure	19/03/2016
		XD500606 Check			21/03/2016
Dhar Wind Power Projects Pvt. Ltd. (Dashera Maidan)	7.5 MW	XD500602 Main	0.2s	Secure	19/03/2016
		XD500603 Check			21/03/2016

30 MW Hatuniya Site, Madhya Pradesh

One Feeder having 10 WTGs (RH3-01 to RH3-10) of 1.5 MW each and another Feeder having 10 WTGs (RH4-01 to RH4-10) of 1.5 MW each.

Feeder Details	Meter Details	Meter serial number	Accuracy class	Make	Date Of Calibration ⁵
Kuchrod Site, Mandasour	RH-3 Main Meter	XB589231	0.2s	Secure	12/04/2016
	RH-3 Check Meter	XC502290	0.2s	Secure	23/04/2016
A F Jalpur, Mandasour	RH-4 Main Meter	XC502289	0.2s	Secure	12/04/2016
	RH-4 Check Meter	XC502293	0.2s	Secure	23/04/2016

10.5 MW and 12.0 MW Vejalpar Site, Gujarat

Meter Details	Line-1 Meters		Line-2 Meters	
	ABT Meter	Check Meter	ABT Meter	Check Meter
Meter Make	Secure	Secure	Secure	Secure
Meter Sl. No	GJ 1319 A	GJU 66431	GJ 1320 A	GJU 66432
Date of Calibration ⁶	31-03-16	01-04-16	02-04-16	03-04-16

³ The energy meters were calibrated on 08/12/2017. Hence, maximum permissible error factor of 0.2% has been applied to the generation values from March 2017 to Dec 2017 due to delay in calibration.

⁴ As the calibration frequency of the meter is once in five year, the calibration reports are valid during the current monitoring period. Hence, error factor has not been applied.

⁵ As the calibration frequency of the meter is once in five year, the calibration reports are valid during the current monitoring period. Hence, error factor has not been applied.

⁶ As the calibration frequency of the meter is once in five year, the calibration reports are valid during the current monitoring period. Hence, error factor has not been applied.