



BUNDLED WIND POWER PROJECT BY GIRIRAJ ENTERPRISES



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Summary:

4K Earth Science Private Limited (4KES) has performed the verification of the project “Bundled Wind Power Project by Giriraj Enterprises” VCS ID 1669, against VCS Standard Version 4. The project involves installation and operation of 96 MW (64 units of ReGen Powertech make 1.5 MW WTG) wind power project in the state of Maharashtra, India. As per register PDD the proposed capacity of the project was 112.5 MW. However later the capacity is reduced to 96 MW as explained in the deviation section below. The project is developed by ‘Giriraj Enterprises’. The electricity generated by the project activity displaces the grid electricity and there by avoid associated CO₂ emission.

The scope of verification includes confirming the implementation of the monitoring plan of the approved VCS PD (version 02) dated 29/03/2017 and the application of the monitoring methodology “ACM0002 version 17: “Grid-connected electricity generation from renewable sources”.

The monitoring period covered in the verification is 01-April-2019 to 29-February-2020 (including both days)

The verification is consisted of three phases: i) desk review of the project; ii) follow-up onsite visit and/or interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted following 4KES internal quality procedures.

During the verification process 05 CARs, 02 CL and 00 FARs were raised. All the findings have been closed satisfactorily and the same has been discussed in Appendix II.

4KES confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. The emission reductions from the project activity “Bundled Wind Power Project by Giriraj Enterprises” in India during the period 01-April-2019 to 29-February-2020 (including both days) amount to 169,561 tonnes of CO₂e.

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1 INTRODUCTION

1.1 Objective

EKI Energy Services Limited has contracted 4K Earth Science Pvt. Ltd (4KES) to perform VCS Verification of the 'Bundled Wind Power Project by Giriraj Enterprises' in India (hereafter called project). This project has already been registered as a VCS project (VCS ID 1669). The objective of this verification is a thorough and independent assessment of registered project activities against the applicable VCS requirement by the DOE. The verification process shall determine whether the proposed project activity complies with the requirements of latest VCS guidelines, applicability conditions of the selected methodology, relevant host country regulations and guidance issued by the VCS Board.

1.2 Scope and Criteria

The scope of verification is to assess the claims and assumptions made in the VCS monitoring report (MR) against the VCS criteria, including but not limited to, VCS standard, applied methodology and other relevant rules and requirements established for VCS project activities.

The Verification is not meant to provide any consulting towards the project participants. However, stated requests for clarification and/or correction actions request may have provided inputs for improvement of the project design

1.3 Level of Assurance

The verification team verified the complete monitoring data for all the parameters of the monitoring plan and confirms that the reported emission reductions are free from any type of material errors. Therefore, 4KES confirms that the verification is conducted with reasonable level of assurance

1.4 Summary Description of the Project

The main purpose of this project activity is to generate clean form of electricity through renewable wind energy sources. The project activity aims to harness wind energy through installation of wind turbine generators with total installed capacity of 96 MW (64 units of ReGen Powertech make 1.5 MW WTG). The bundled project consist 5 wind projects and the details of the projects are given below:

Sr. No.	Project Capacity (in MW)	Owner of Project	Project Location	State
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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

It also noted that the capacity of the project as per registered is PDD 112.5 MW. But now the capacity of the project has been downsized to 96 MW due to the below reason,

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

The deviation from project description is assessed under section 3.3 below.

As per MR, the electricity generated from the project is sold to respective state DISCOM which is confirmed form approved VCS PD/4/ and interview with PP.

The WTGs are commissioned between 31-03-2015 and 31-03-2017 and the COD details are provided in section 4.1 below. The commissioning dates of the WTGs are verified against the approved VCS PD/4/ and commissioning certificates/7/.

Location of the project was verified through Google Map (<https://maps.google.com/maps>) and found consistent with the data provided in the registered PD/4/

The Project activity is a new facility (Greenfield) and the electricity delivered by the project activity is exported to the Indian national grid. The project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid.

As per registered PDD, the project activity results in replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 218,910 tCO₂e per year, thereon displacing 223,906 MWh/year amount of electricity from the grid.

During the monitoring period from 01-April-2019 to 29-February-2020 (including both days), the project replaced 169,561 tonnes of CO₂e by displacing the 173,469.88 MWh electricity.

2 VERIFICATION PROCESS

The registered VCS project is undergoing 4th verification under VCS (1st Crediting period), the approach adopted to ensure the quality of emission reductions is described in the following sections.

2.1 Method and Criteria

4KES assessed and determined whether the proposed implementation and operation of the project activity, and the steps taken to report emission reductions comply with the criteria and relevant guidance provided by the VCS Board. The validation/verification process consists of the following three phases;

- A desk review of the VCS PD and VCS MR
- Site visit and/or follow up interviews with project stakeholders
- The resolution of outstanding issues and issuance of final report and opinion.

The prepared verification report and other supporting documents then undergo an internal quality control before being submitted to the VCS executive board for issuance of credits as per VCS standard version 4.

2.2 Document Review

The verification is performed primarily as a document review of the approved VCS PD, previous MR and Verification report and associated documents as stated in detail in appendix 1 of this document. The assessment is performed by a verification team using a protocol. The cross checks between information provided in the Monitoring report, VCS PD and information from sources other than those used, if available, the team's sectoral or local expertise and, if necessary, independent background investigations

2.3 Interviews

Due nationwide lockdown due to COVID-19 spread, Verification team could not conduct the site visit. Since the date of closure of lockdown is uncertain due to the increase spread of COVID-19 and hence VVB did not conduct site visit for this project activity. However, the verification team performed the telephonic interview with the site person and reviewed documents to achieve a reasonable level of assurance in the verification. This is in line with Section 4.1.2 of the VCS Standard, v4.0 which does not explicitly mandate site visits as part of the validation and verification process, only that VVBs must achieve a reasonable level of assurance on all validations and verifications.

No sampling procedures were adopted in document verification and all the document were cross checked to ensure conservative estimation of emission reduction. Kindly find below names of the persons interviewed (telephonic interview).

Sr. No	Name of the person	Role/Designation
1	Mr. Kailash Bankar	PP Representative
2	Mr. Mohan Kumar	Site In-charge, Hatuniya Site
3	Mr. Ashish Singh	Site In-charge, Dewas Site
4	Mr. Jatin Kumar	Site In-charge, Vejalpar Site
5	Mr. Kingshuk Das	Project Manager, EKI Energy Services Limited

2.4 Site Inspections

As mentioned above, due nationwide lockdown due to COVID-19 spread, Verification team could not conduct the site visit. Since the date of closure of lockdown is uncertain due to the increase spread of COVID-19 and hence VVB did not conduct site visit for this project activity. However, the verification team performed the video conference and telephonic interview with the PP, Consultant and the site person and reviewed documents to achieve a reasonable level of assurance in the verification. This is in line with Section 4.1.2 of the VCS Standard, v4.0 which does not explicitly mandate site visits as part of the validation and verification process, only that VVBs must achieve a reasonable level of assurance on all validations and verifications

2.5 Resolution of Findings

The objective of this step is to identify, discuss and conclude on the issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and onsite assessment. The verification team prepares and/or updates a verification protocol (internal document) that records the conformities and non-conformities, which may be of following types;

CAR (Corrective Action Request) is raised if one of the following occurs:

- Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;

- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CLs raised by the 4KES during verification shall be resolved prior to submitting a request for issuance.

FAR (Forward Action Request) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

During the Verification process, total 05 CAR and 02 CL were raised and resolved satisfactorily. No FAR has been raised in the verification. The list of CARs/CLs/FARs raised and the response provided, the mean of validation, reasons for their closure and references to correction in the relevant documents are provided in Appendix II of this report.

2.5.1 Forward Action Requests

The project activity is undergoing 4th verification of 1st crediting period under VCS; there were no FARs raised during the validation or previous verification.

2.6 Eligibility for Validation Activities

The Validation and verification body holds accreditation to carry out both validation and verification activities. The accreditation scope can be checked from the below link:

<http://cdm.unfccc.int/DOE/list/DOE.html?entityCode=E-0069>

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is registered under the VCS only (VCS Project ID 1669) and is not registered under any other emissions trading program or any other mechanism that includes GHG allowance trading. Initially the PP applied this project for CDM registration, however later the CDM validation is terminated and PP registered the project in VCS. PP also confirms that net GHG emission reductions or removals generated during this monitoring period shall not be used for compliance under any such programs or mechanisms. This was confirmed through a declaration/16/ submitted by the PP and hence accepted by the assessment team.

3.2 Methodology Deviations

There is no methodology deviation applied during the current monitoring period.

3.3 Project Description Deviations

As per registered PDD, the proposed installed capacity of the project is PDD 112.5 MW. But now the capacity of the project has been downsized to 96 MW due to the below reason,

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

Verification team interviewed with PP representative and confirmed the reason provided for the deviation is correct. The deviation does not affect the methodology or the appropriateness of the baseline scenario. The impact of deviation on the additoinality is assessed below.

Assessment of impact on additoinality:

In the registered PD, the additoinality is assessed for individually for all projects, the cancellation of the 15 MW capacity in Khareda site, Gujarat will not affect the additoinality of the overall project.

For the capacity reduction from 13.5 MW to 12.0 MW in Vejalpar site, Gujarat, the reduction in project capacity will results in reduction in generation, project cost & O&M cost, PP has submitted the initial IRR sheet (as per the registered PDD)/19/ and revised IRR calculation sheet/20/ with the reduced capacity for the Vejalpar site, Gujarat. Verification team checked the IRR sheet and found that all the costs, expenses and revenues are considered only for 12 MW capacity. Verification team also observed that due to the reduction in project capacity the equity IRR is changed from 6.92% to 6.8% which is still below the selected benchmark ie,

15.43%. Hence, verification team concluded that the reported downsizing of the project capacity does not affect the additionality of the project.

Hence, this deviation in the project description is found to be acceptable.

3.4 Grouped Project

Not applicable. The project activity is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity is installation of 96 MW wind power project, promoted by Giriraj Enterprises. This project consist 64 units of ReGen Powertech make 1.5 MW WTG. The purpose of the project activity is to generate clean electricity with utilization of wind energy. The WTG locations and commissioning details of the WTGs are are given below:

S. No.	Project Owner	Machine ID	DOC ¹	Village	Taluka/ District/ State	Latitude	Longitude
1	Giriraj Enterprises	RISPL/15 00/16- 17/4049	02-03- 2017	Kumbhariya	Morbi Taluk, Morbi Dist, Gujarat	23° 07' 38.4492"	76° 56' 49.0040"
2		RISPL/15 00/16- 17/4050				23° 08' 13.4232"	76° 56' 36.1521"
3		RISPL/15 00/16- 17/4051				23° 08' 05.4420"	76° 56' 53.2250"
4		RISPL/15 00/16- 17/4052				23° 07' 58.2384"	76° 58' 13.4000"
5		RISPL/15				23° 07'	76° 56'

¹ Date Of commissioning

		00/16-17/4053				52.4352"	48.2921"
6		RISPL/15 00/16-17/4054				23° 08' 04.5960"	76° 57' 58.8007"
7		RISPL/15 00/16-17/4055				23° 07' 28.3728"	76° 57' 54.4416"
8		RISPL/15 00/16-17/4542				23° 04' 36.4872"	76° 53' 03.0658"
9		RISPL/15 00/16-17/4543				23° 05' 11.8644"	76° 53' 04.9294"
10		RISPL/15 00/16-17/4544				23° 05' 13.9056"	76° 52' 46.5106"
11		RISPL/15 00/16-17/4545				23° 05' 00.0420"	76° 52' 42.3122"
12		RISPL/15 00/16-17/4546				23° 04' 41.2320"	76° 52' 49.2536"
13		RISPL/15 00/16-17/4547				23° 05' 07.5228"	76° 53' 19.9076"
14		RISPL/15 00/16-17/4548				23° 04' 35.1336"	76° 53' 53.5708"
15		RISPL/15 00/16-17/4549				23° 05' 18.3840"	76° 53' 57.6920"
16		RH3- 01				23° 53' 55.3848"	81° 14' 00.4539"
17		RH3- 02				23° 52' 51.1176"	81° 13' 50.1898"

18		RH3- 03		Ratikhedi	Madhya Pradesh	23° 53' 15.6300"	81° 13' 52.2136"
19		RH3- 04		Ratikhedi		23° 53' 45.4092"	81° 14' 18.1189"
20		RH3- 05		Ratikhedi		23° 53' 50.4636"	81° 14' 08.8622"
21		RH3- 06		Kankarwa	Jaora Taluk, Ratlam Dist, Madhya Pradesh	23° 51' 36.6264"	81° 13' 46.2748"
22		RH3- 07		Bholiya	Mandsaur Taluk, Mandsaur Dist, Madhya Pradesh	23° 52' 34.2552"	81° 14' 02.0410"
23		RH3- 08		Kankarwa	Jaora Taluk, Ratlam Dist, Madhya Pradesh	23° 51' 31.3164"	81° 13' 54.2911"
24		RH3- 09		Bholiya	Mandsaur Taluk, Mandsaur Dist, Madhya Pradesh	23° 52' 05.6028"	81° 13' 22.5297"
25		RH3- 10		Bholiya		23° 51' 57.0204"	81° 13' 20.6057"
26		RH4- 01		Jogikheda		23° 55' 44.0760"	81° 13' 01.3611"
27		RH4- 02		Ratikhedi		23° 54' 41.4036"	81° 13' 35.2470"
28		RH4- 03		Kuchdod		23° 54' 29.5380"	81° 14' 57.4242"
29		RH4- 04		Khajuri Anjana		23° 55' 26.4576"	81° 13' 22.4496"

30		RH4- 05		Ratikhedi		23° 54' 32.5872"	81° 13' 38.4149"
31		RH4- 06		Khajuri Anjana		23° 55' 36.1776"	81° 13' 23.8105"
32		RH4- 07		Khajuri Anjana		23° 55' 31.0548"	81° 14' 19.1617"
33		RH4- 08		Khajuri Anjana		23° 55' 18.7068"	81° 13' 29.2986"
34		RH4- 09		Khajuri Anjana		23° 54' 41.8464"	81° 14' 45.3159"
35		RH4- 10		Kuchdod		23° 54' 33.3612"	81° 14' 45.5120"
36		TK- 01		Bhoj Pura		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	Giriraj Enterprises	TK- 08	30-05- 2016	Bhoj Pura	Tonk Khurd Taluk, Dewas Dist, Madya Pradesh	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		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	Giriraj Enterprises	TIR- 06	31-03- 2016	Navgaon	Dhar Taluk, Dhar Dist, Madhya Pradesh	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"
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Starting date of the operation of the project activity is 31-March-2015 which is the date of commissioning/commercial operation of the 1st WTG/

The WTG installed in the project is ReGen Powertech make 1.5 MW WTG. The technical specification of the WTG is as below:

Particulars	Details
Make	ReGen Powertech
Rated power	1500 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	22 m/s
Survival wind speed	52.5 m/s
Generator	Variable Speed Multi Pole Synchronous
Rotor Diameter	87 m
Swept area	5942 m ²
Speed Range	9 to 17.3 rpm
Hub Height	85 m
Design	Tubular, Four Sections
Foundation Type	Floating
Control of Output	Pitch Regulation
Speed Control	Variable, micro controller based
Low Voltage Ride Through (LVRT)	3 seconds
Primary Brake system	Aerodynamic
Pitch System	Electromechanical
Remote Monitoring	VPN
Wind Turbine type class	GL III B

Design Lifetime	25 years
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The installation and specification of Wind turbine Generators has been checked with WTG Technical Specification/6/ and commissioning certificates/7/. The commissioning has also been duly validated in the VCS validation report of the project activity/04/. There was no major breakdown or shutdowns during the monitoring period which might affect the applicability of methodology or might cause material errors in emission reductions.

Assessment team concludes the following:

- a) There is no material discrepancies between project implementation and the project description provided in the registered PD/04/.
- b) The monitoring plan is implemented completely and monitoring system (i.e., process and schedule for obtaining, recording, compiling and analysing the monitored data and parameters) is appropriate.
- c) There is no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology/08/.
- d) The GHG emission reductions or removals generated by the project have not included in an emissions trading program or any other mechanism that includes GHG allowance trading/16/.
- e) The project has not received or sought any other form of environmental credit, or has become eligible to do so since validation or previous verification.
- f) The project is registered under VCS only.
- g) The project activity is comply with indicators for sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects from India as discussed under section 1.11 of MR.

In view of the information's as verified above the assessment team is able to conclude that the project has been implemented as described in the project description.

4.2 Safeguards

4.2.1 No Net Harm

The project is a wind power project which is a cleaner source of power generation. The wind power project does not emit any GHG or any other toxic gases. Hence, wind turbine generator has no significant impact on the environment. As per the EIA notification dated 14thSeptember

2006, the wind power projects are exempted from environmental clearance. Hence, Environmental impact assessment is not required for this project activity.

The report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013 also confirms that wind power project activity operations do not result in direct air pollution, noise pollution. Hence verification team confirms that there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity.

4.2.2 Local Stakeholder Consultation

As per the section 2.2 of the MR, the projects have continuous feedback mechanism and kept a grievance register to receive any feedback/grievances from stakeholder. Verification team conducted telephonic interview with site in-charge and found that the continuous feedback mechanism is implemented effectively.

As verified from the copy of grievances registers from each site/19/ no grievances/feedback received on the operation of the project activity. However, some grievances received related to CSR activities undertaken by the PP. The details of the grievances received are provided in the MR. Verification team discussed with the site in-charge and confirmed that all the grievances are addressed by PP.

4.3 AFOLU-Specific Safeguards

Not Applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

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 VCS PD and MR.

In detail the following has been verified:

Transparency: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.

Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.

Correctness: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology.

Completeness: It has been checked whether all calculations are complete and without omissions

Baseline emission: The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor. The grid in this case would be the 'Indian National Grid'

Formula Used:-

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

Where:

BE_y : Baseline emissions in year y (tCO_{2e}/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 VCS 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" (tCO_{2e}/MWh)

The verification team has checked the entire monthly JMR reports and invoices applicable for the monitoring period as per the project activity applied for verifications and found all the parameters are monitored and recorded as per the monitoring plan in the approved PD. The verification team has crosschecked the emission reduction sheet and monitoring report data with the JMR sheet and invoice bills and found all the values are matching.

Project Emission: As per the applied methodology, para 37 of ACM0002 version 17, "For all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected". Since the project is a wind power project, $PE_y = 0$.

Leakage: As per methodology and registered PDD the leakage is zero. $LE_y = 0$.

Emission Reduction:

Emission reduction is calculated as below:

$$ER_y = BE_y - PE_y - LE_y$$

PP has submitted emission reduction the calculation in the excel sheet/2/. The emission reduction calculation in the excel sheet is checked whether the calculation is in accordance with the formula given in the approved PD/4/ and the selected methodologies/8/.

The verification team confirms the following:

- The calculations of emission reduction have been carried out in accordance with the equations and methods described in the registered monitoring plan and applied methodology.
- The emission factor applied is an ex-ante value valid for the fixed crediting period.
- Any assumptions used in emission or removal calculations have been justified.
- Appropriate emission factor and other reference values have been correctly applied. It can be confirmed that the emission reduction calculation is overall correct.
- The ER calculation sheet provided is clear, transparent and the calculations provided in the sheet are reproducible.
- Hence, the emission reduction reported in the monitoring report for the monitoring period is verified to be correct

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The only monitoring parameter in the project activity is “Quantity of net electricity generation supplied by the project (Wind) plant/unit to the grid in year y” ($EG_{PJ, y}$). This parameter is monitored through energy meters installed in the site at every feeder. The energy meters at the substation both export and import electricity and monthly reading is recorded by personal from respective state DISCOM. The gross export, import and adjusted export (based on the transmission loss) are recorded in the Joint meter reading statement issued by DISCOM. The net electricity export $EG_{PJ, y}$ is estimated from the difference of export & import (ie, $EG_{PJ, y} = \text{Export} - \text{Import}$). For the Gujarat project the JMR/Share certificate provided by GETCO does not have split-up of export and import and directly provides the net electricity supplied to the grid. The monthly export, import and net export are recorded in the Joint meter reading (JMR) report which is signed by DISCOM and PP. The appropriateness of reading is assessed as below:

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	The electricity exported to the grid is measured through energy meters at site location on continuous basis and reported monthly.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the approved PD/04/ and monitoring methodology/8/.

Monitoring equipment	Energy meters (main & Check) installed at substation.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	All the energy meters are two-way tri-vector meters of accuracy class 0.2s. Accuracy of the monitoring equipment's is in accordance with the monitoring plan as outlined in the PD.
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes the accuracy valid for the entire measuring range.
Calibration frequency /interval:	5 year
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	There was no delay in meter calibration.
Is the calibration of measuring equipment carried out by an accredited person or institution?	Calibration of the measuring equipment's is carried out by an accredited entity.
Is(are) calibration(s) valid for the whole reporting period?	There was no delay in meter calibration and hence the calibration is valid for whole reporting period.
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes, calibration carried out for a measuring range comparable with the range for which measurements have been carried.
How were the values in the monitoring report verified?	Reported values of this parameter have been verified with monthly joint metering report/12/. Value of this parameter for the current monitoring period is verified as 173,469.88 MWh. Furthermore monthly values of this parameter is reported in the ER calculation sheet/02/

	are also verified with the MR/01/ and found to be consistent.
If applicable, has the reported data been cross-checked with other available data?	The monthly reported values of this parameter were further cross checked with the monthly invoices raised by the PP /13/ and found to be consistent.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the adequate QA/QC procedures were implemented by all the stakeholders, namely, the Grid Authority, the PP and the O&M Contractor. The Net electricity exported to the grid can be cross checked against the invoice raised by the PP towards the DISCOM and found to be correct
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.

Parameter fixed ex-ante:

EF_{grid,OM,y}; tCO_{2e}/MWh: it is the operating margin emission factor of Indian grid fixed at the time of project registration and mentioned value of 0.9941 tCO_{2e}/MWh is consistent with the PD/04/.

EF_{grid,BM,y}; tCO_{2e}/MWh: it is the build margin emission factor of Indian grid fixed at the time of project registration and mentioned value of 0.9285 tCO_{2e}/MWh is consistent with the PD/04/.

EF_{grid,CM,y}; tCO_{2e}/MWh: it is the combined margin emission factor Indian grid fixed at the time of project registration and mentioned value of 0.9777 tCO_{2e}/MWh is consistent with the PD/04/.

Calibration of meters:

During the verification assessment of the project activity, accuracy of all the metering have been checked and found appropriate. As per the approved PD, the calibration frequency of energy meter is 5 years. Details of meter calibration are provided in below table:

22.5 MW Dewas Site, Madhya Pradesh

Feeder Details	Capacity	Meter serial number	Accuracy class	Make	Date Of Calibration	Validity
Prisma Feeder 1 (Dewas)	10.5 MW (7 x 1.5 MW)	XD500621 Main	0.2s	Secure	08/12/2017	07/12/2022
		XD500620 Check				
Prisma Feeder 2 (Dewas)	12 MW (8 x 1.5 MW)	XD500619 Main	0.2s	Secure	08/12/2017	07/12/2022
		XD500622 Check				

21 MW Dhar Site, Madhya Pradesh

Feeder Details	Capacity	Meter serial number	Accuracy class	Make	Date Of Calibration	Validity
Tirupati Dhar Renewable Power Pvt. Ltd (Jaitpura)	13.5 MW (9 x 1.5 MW)	XD500605 Main	0.2s	Secure	19/03/2016	18/03/2021
		XD500606 Check			21/03/2016	20/03/2021
Dhar Wind Power Projects Pvt. Ltd. (Dashera Maidan)	7.5 MW (5 x 1.5 MWW)	XD500602 Main	0.2s	Secure	19/03/2016	18/03/2021
		XD500603 Check			21/03/2016	20/03/2021

30 MW Hatuniya Site, Madhya Pradesh

Feeder Details	Meter Details	Meter serial number	Accuracy class	Make	Date Of Calibration	Validity
Kuchrod Site, Mandsour (10 x 1.5 MW)	RH-3 Main Meter	XB589231	0.2s	Secure	12/04/2016	11/04/2021
	RH-3 Check Meter	XC502290	0.2s	Secure	23/04/2016	22/04/2021
A F Jalpur, Mandsour	RH-4 Main Meter	XC502289	0.2s	Secure	12/04/2016	11/04/2021

(10 x 1.5 MW)	RH-4 Check Meter	XC502293	0.2s	Secure	23/04/2016	22/04/2021
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10.5 MW and 12.0 MW Vejalpar Site, Gujarat

Meter Details	Line-1 Meters (7 x 1.5 MW)		Line-2 Meters (8 x1.5 MW)	
	ABT Meter	Check Meter	ABT Meter	Check Meter
Meter Make	Secure	Secure	Secure	Secure
Meter SI. No	GJ 1319 A	GJU 66431	GJ 1320 A	GJU 66432
Date of Calibration	31-03-2016	01-04-2016	02-04-2016	03-04-2016
Validity	30-03-2021	31-03-2021	01-04-2021	02-04-2021

The energy meter calibration certificates/14/ are checked and found that the calibration details provided in the MR is correct. Verification team also confirms that the energy meters are calibrated as per the frequency mentioned in the PD and during the monitoring period calibration all the energy meters are valid.

The assessment team has verified the monthly joint meter reading report issued by respective state utility and confirmed that only the data recorded through main meters is used to calculate net electricity supplied to the grid by the projects belongs to particular developer and consequently for ER calculations. As verified through the calibration certificates, that meters were working satisfactorily during the current monitoring period.

In view of the above discussion the assessment team able to confirm that evidence used to determine the GHG reductions and removals are sufficient and appropriate with respect to quality and quantity.

GHG Calculations

The emission reduction as per the applied methodology equals the baseline emissions (project emissions and leakage emissions for such project activities is considered zero). The formula provided for the calculation of baseline emissions is:

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

$$BE_y = EG_{facility,y} * EF_y$$

Since project emission and leakage are zero, baseline emission is equal to emission reduction.

$$ER_y = BE_y$$

The emission reduction is estimated for each month in ER calculation sheet, and the summary of emission reduction is as below:

Year	2019- Emission	Year	2020- Emission	Total Emission Reduction
Reduction (tCO2e)*		Reduction (tCO2e)*		(tCO2e)
148,361		21,200		169,561

* rounded down value

The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed. The assumptions, emission factors and default values that were applied in the calculations are justified. All the data were made available and have monitored as per required monitoring frequency. The means of verification for the values of parameters, used for baseline emission calculation, is described above.

However, verification team has observed that the actual ER achieved during the current monitoring period is 0.25% higher than the estimated ER as per registered PD for the comparable period. This comparison is submitted in the ER sheet along with a justification confirming that this event of higher power generation was an unforeseen situation and also not under the direct control of PP. The verification team has reviewed and verified the facts and supporting provided by PP and able to conclude that justification is valid and such condition is an unforeseen event which is not a regular affair in the project activity, moreover PP does not have any direct control on it. It is also noted that the 0.25% increase in PLF is within the financial analysis sensitivity limit mentioned in the PDD and hence does not affect the additionality of the project.

4.6 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION CONCLUSION

4K Earth Science Pvt. Ltd (4KES), contracted by EKI Energy Services Limited, has performed the independent verification of the emission reductions for the VCS project activity (VCS ID-1669) “Bundled Wind Power Project by Giriraj Enterprises” in India for the monitoring period 01-April-2019 to 29-February-2020 as reported in the Monitoring Report Version 02 dated 16/04/2020. The EKI Energy Services Limited and the respective project proponent are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity. It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity

4KES commenced the verification on the basis of the baseline and monitoring methodology ACM0002 version 17, the monitoring plan contained in the registered PD Version 02 dated 28/03/2017 and VCS guidelines version 4, Monitoring Report Version 02 dated 16/04/2020 as per the process described under Section 2 of this report.

4KES 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. 4KES planned and performed the verification by obtaining evidence and other information and explanations that 4KES considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

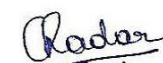
In our opinion the GHG emissions reductions reported for the project activity for the period 01-April-2019 to 29-February-2020 are fairly stated in the Monitoring Report Version 02 dated 16/04/2020. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002 version 17, and the VCS standard.

Verification period: From 01-April-2019 to 29-February-2020

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)
2019	148,361	0	0	148,361
2020	21,200	0	0	21,200
Total	169,561	0	0	169,561

Approved by
Chandrakala R.
Director



4K Earth Science Private Limited

Date: 29-April-2020

Place: Bangalore, India

APPENDIX I: LIST OF DOCUMENTS

Ref. No	Title of Document	Version	Date
1	Monitoring Report	1.0	14/03/2020
		2.0	16/04/2020
2	Emission Reductions Calculation Spread sheet	1.0	14/03/2020
		2.0	16/04/2020
3	VCS Project page: https://registry.verra.org/app/projectDetail/VCS/1669	-	-
4	Project Description	2	28/03/2017
	Validation Report	1	30/03/2017
5	Previous Monitoring Report (3 rd Monitoring)	2	14/05/2019
	Previous Verification Report (3 rd Verification)	1	16/05/2019
6	Technical specifications of the WTG		
7	Commissioning certificates of the Wind Turbine Generator implemented in the project sites.	-	-
8	CDM Methodology: ACM0002, "Grid-connected electricity generation from renewable sources"	17.0	-
9	VCS Standard	Version 4	19/09/2019
	VCS Program Guide	Version 4	19/09/2019
10	Clean Development Mechanism Validation and Verification Standard	02.0	29/11/2018
9	Grievances Registers	-	-
12	Joint Meter Reading for the monitoring period	-	-
13	Invoices for the electricity sold for the monitoring period	-	-
14	Energy meter Calibration Certificates		
15	Break down details of the complete monitoring period	-	-
16	Declaration regarding no participation in other GHG program for the concerned monitoring period	-	-
17	Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013	-	-
18	MOEF Notification http://envfor.nic.in/legis/eia/so1533.pdf		14/09/2006
19	Original IRR calculation sheet for Vejalpar site, Gujarat (for 13.5 MW capacity)	2	28/03/2017
20	Original IRR calculation sheet for Vejalpar site, Gujarat (for 13.5 MW capacity)	3	-

APPENDIX II: VERIFICATION FINDINGS

Clarification Requests

CL ID	01	Section no.		Date: 28/03/2020
Description of CL				
In section 4.2, it is mentioned that net electricity supplied by the project is calculated as below: Net electricity generated and supplied by the project (Wind) plant/unit to the grid = Electricity Export to the grid – Electricity Import from the grid From the ER calculation sheet, it is observed that only electricity export details are considered; the import details are not deducted from export for the Gujarat projects. PP is requested to clarify the same.				
Project participant response				Date: 16/04/2020
<i>For the Gujarat sites, Share Certificates are provided by GETCO in which only the values of Net electricity exported are provided. Hence for the Gujarat sites, only the Net electricity exported has been considered for the Emission Reduction calculation.</i>				
Documentation provided by project participant				
<i>Share certificates are provided for the Gujarat sites.</i>				
DOE assessment				Date: 23/04/2020
As mentioned by PP, the share certificate provided by GETCO does not provide breakup of export and import and directly provides the Net electricity supplied by the project. The same is confirmed from interview with Site personnel from the Gujarat site. Hence, it is accepted. CL is closed.				

CL ID	02	Section no.		Date: 28/03/2020
Description of CL				
As per the registered PD, the total installed capacity of the project is 112.5 MW. But in the Monitoring report, only 96 MW is considered. This is a deviation from project design. But no explanation is provided in the Monitoring report. PP is requested to clarify how the project comply with the section 3.18 requirements of VCS Standard v4.				
Project participant response				Date: 16/04/2020
At the time of registration, the total capacity of the project activity was 112.5 MW. But now the capacity of the project has been downsized to 96 MW. This is because, - The earlier, 13.5 MW capacity wind project by Giriraj Enterprises at Vejalpar site, Gujarat has been downsized to capacity of 12.0 MW; and - The earlier, 15 MW capacity wind project by Giriraj Enterprises at Khareda site, Gujarat has been cancelled by the PP and has not been commissioned. <i>The same is now mentioned in the Section 1.1 of the Monitoring Report and also under project description deviation, i.e. section 2.3.2 of the Monitoring report.</i>				
Documentation provided by project participant				

<i>Revised MR, Version-2</i>	
DOE assessment	Date: 23/04/2020
The justification provided by PP is found to be correct. The same has been justified under Section 2.3.2 of the monitoring report as deviation to the project description. Since, the emission reduction is claimed only for the commissioned units this seems to be acceptable. CL is closed.	

Corrective Action Requests

CAR ID	01	Section no.		Date: 28/03/2020
Description of CAR				
In the MR, PP shall follow instruction of completing Monitoring report. In specific, the shall following the following instruction: - The table in title page should be completed using Arial or Century Gothic 10.5 point, black, regular (non-italic) font - All other sections should be completed using Arial or Franklin Gothic Book 10.5 point, black, regular (non-italic) font				
Project participant response				Date: 16/04/2020
<i>The font size and font style have now been corrected throughout the Monitoring Report.</i>				
Documentation provided by project participant				
<i>Revised MR, Version-2.</i>				
DOE assessment				Date: 23/04/2020
The font size and font style has been corrected now in the monitoring report. CAR is closed.				

CAR ID	02	Section no.		Date: 28/03/2020
Description of CAR				
In section 2.2 of the MR (Local Stakeholder Consultation), the following details are missing: - Grievances received during the monitoring period - How due account of all and any input received during ongoing communication/ Grievances has been taken				
Project participant response				Date: 16/04/2020
<i>The grievance related details have now been provided in section 2.2 of the Monitoring report</i>				
Documentation provided by project participant				
<i>Revised MR, Version-2.</i>				
DOE assessment				Date:
As per the grievance register there is no grievance relevant to the project has been received. However, the grievances related to the CSR activities undertaken by PP have been received. All the grievances received during the monitoring period are addressed by PP. The same is confirmed from the verification of grievances register and from site personnel. The details have been included in the MR. CAR is closed				

CAR ID	03	Section no.		Date: 28/03/2020
Description of CAR				
PP has considered the monitoring period of 01-April-2019 to 29-Feb-2020 (first and last date included). However from the verification of ER calculation sheet the following observations found:				
- February 2020 generation is not considered for all the projects in the ER calculation - January 2020 details are not considered for the projects 13.5 MW Dhar, 7.5 MW Dhar, 22.5 MW Dewas				
Project participant response				Date: 16/04/2020
<i>The Generation details for the month of January-2020 and February-2020 have been included in the ER sheet.</i>				
Documentation provided by project participant				
<i>Revised ER sheet.</i>				
DOE assessment				Date: 23/04/2020
The January & February 2020 generation details are now included for all the sites. The respective JMR's are verified and found that the details provided in the ER sheet are correct. CAR is closed.				

CAR ID	04	Section no.		Date: 28/03/2020
Description of CAR				
In the ER sheet, the generation details provided for the month of December 2019 for the project '22.5 MW in Dewas' is not consistent with respective JMR readings & Invoice. PP is requested to correct the same.				
Project participant response				Date: 16/04/2020
<i>The generation details of site "22.5 MW Dewas" for the month of December-2019 has now been corrected in the ER sheet as per the JMR.</i>				
Documentation provided by project participant				
<i>Revised ER sheet.</i>				
DOE assessment				Date: 23/04/2020
The generation details for December 2019 for the 22 MW Dewas project has been corrected. The values are now consistent with the respective JMR reading & Invoice. CAR is closed.				

CAR ID	05	Section no.		Date: 28/03/2020
Description of CAR				
In Appendix 1 of the MR, PP has provided the calibration details of the energy meter. However, the calibration certificate is not submitted to DOE for verification.				
Project participant response				Date: 16/04/2020
<i>The calibration certificates of the Energy Meters are now provided to the DOE assessment team.</i>				
Documentation provided by project participant				
<i>Calibration Certificates of the Energy Meters.</i>				
DOE assessment				Date: 23/04/2020

The calibration certificate of energy meters are now provided. The calibration certificate are verified and found to be correct.
CAR is closed.

Forward Action Requests

FAR ID	Section no.	Date:
Description of CAR		
NA		
Project participant response		Date: 20/04/2020
Documentation provided by project participant		
DOE assessment		Date: 23/04/2020

APPENDIX III: TEAM COMPETENCE

<u>Certificate of Competence</u>						
Name	☒ Mr. ☐ Ms.	Narendra Kumar .R				
Qualification Procedure	Fulfil the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
<i>Appointed</i>	Yes	Yes	Yes	Yes	Yes	No
<i>Appointed Date</i>	29-07-2019					
Authorized to work as Technical Expert for:						
Authorized Technical Area	Sectoral Scope	TA Code	Technical Area within the scope			
	Energy industries (renewable - / non-renewable sources)	1.1	Thermal energy generation			
	Energy industries (renewable - / non-renewable sources)	1.2	Renewables			
	Energy demand	3.1	Energy demand			
	Waste handling and disposal	13.1	Solid waste and wastewater			

Authorized to work as Local Expert for:			
Country/Countries	India		
Compliance check by: Anand S. R.			

<u>Certificate of Competence</u>						
Name	☒ Mr. ☐ Ms.	Ma Paa Puratchikkanal				
Qualification Procedure	Fulfills the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
Appointed	Yes	Yes	Yes	Yes	Yes	No
Appointed Date	29-07-2019					
Authorized to work as Technical Expert for:						
Authorized Technical Area	Sectoral Scope	TA Code	Technical Area within the scope			
	Energy industries (renewable - / non-renewable sources)	1.1	Thermal energy generation			
	Energy industries (renewable - / non-renewable sources)	1.2	Renewables			
	Energy demand	3.1	Energy demand			
	Construction	6.1	Construction			
	Waste handling and disposal	13.1	Solid waste and wastewater			
	Agriculture	15.1	Agriculture			
Authorized to work as Local Expert for:						
Country/Countries	India					
Compliance check by: Anand S. R.						

APPENDIX IV: ABBREVIATIONS

ACM	Approved Consolidated Methodology
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
DPR	Detailed Project Report
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel for Climate Change
JMR	Joint Meter Readings
LCS	Local Controller System
MP	Monitoring Period
MR	Monitoring Report
MW	Mega Watt
MWh	MegaWatt hour
OM	Operating Margin
O&M	Operation & Maintenance
PD	Project Description
PP	Project proponent
PPA	Power Purchase Agreement
QA/QC	Quality Assurance/Quality Control
tCO ₂	Tonnes of Carbon Dioxide
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit