




**Validation report form for renewal of crediting period for
CDM project activities
(Version 03.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Grid Connected Wind Power Project by M/s Giriraj Enterprises in Madhya Pradesh (UNFCCC Ref, No. - 5938)
Number and duration of the next crediting period	2 nd Crediting period (20/08/2019 to 19/08/2026)
Version number of the validation report	01
Completion date of the validation report	18/10/2019
Version number of PDD to which this report applies	Version 4 dated 18/09/2019
Project participants	M/s Giriraj Enterprises
Host Party	India
Applied methodologies and standardized baselines	AMS- I.D "Grid connected renewable electricity generation (Version- 18)
Mandatory sectoral scopes	01
Conditional sectoral scopes, if applicable	NA
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	23,915 tCO ₂ e per annum
Name and UNFCCC reference number of the DOE	LGAI Technological Center, S.A. (Applus+ Certification) UNFCCC Ref. No.: E-0032
Name, position and signature of the approver of the validation report	Mr. Juan Sendín Caballero Applus+ Certification Business Unit Managing Director Signature: 

SECTION A : Executive summary

M/s. Giriraj Enterprises is implementing a “Grid Connected Wind Power Project by M/s Giriraj Enterprises in Madhya Pradesh”. The project activity will consist of 10 WTGs of capacity 1.5 MW each with total capacity of 15 MW (10 WTGs × 1.50 MW). Wind Turbine Generators (WTGs) of Class S-82 manufactured by M/s. Suzlon Energy Limited. The project activity will supply the generated electricity to NEWNE Grid of India. The proposed project activity is located at Barda Barkheda, Taluka: Barod, District: Shajapur, Madhya Pradesh in India.

The purpose of the project activity is generation of clean electricity by utilizing kinetic energy of wind. In the absence of the project activity, the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the NEWNE grid.

Purpose of the project activity:

To generate clean energy by installing WTGs at a site located in Barda Barkheda, Shajapur district in the state of Madhya Pradesh.

Since the proposed project activity is a Greenfield project, the approved methodology AMS-I.D. already prescribes the baseline scenario as being “Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the Tool to calculate the emission factor for an electricity system”. The electricity exported by the proposed project activity would displace an equivalent amount of electricity generated by the power plants already operational and proposed to be added in the Indian Grid which relies predominantly on power plants running on fossil fuels (particularly coal).

Thus, it contributes towards reduction in the demand-supply gap during periods of electricity shortage and increase in the share of renewable energy in the grid mix.

The Indian grid is mainly dominated by fossil fuel-based power projects. The development of the project activity would reduce generation of electricity in the Indian grid by fossil fuel-based power projects. This will help to mitigate Green House Gases (GHGs) emission by fossil fuel-based power projects and contribute to conservation of fossil fuel resources.

Validation Scope: The scope is defined as an independent and objective review of the project design document (PDD). The PDD 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, including the approved baseline and monitoring methodology AMS-I.D. version 18.0. The validation was based on the requirements in the Validation and Verification Standard (VVS version 02) for project activity

The validation 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 project design document.

Validation Process: The project assessment is based on the “Clean Development Mechanism Validation and Verification Standard version 02.0 for project activity 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 CDM project activity are appointed.

Once the project is made available for the global stakeholder consultation process, the members of the assessment team carried out:

I A desk review of the project design documentation;

- II Follow-up interviews with project stakeholders;
 III The resolution of outstanding issues and the issuance of the final validation report and opinion.

The prepared validation report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the CDM-EB.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. 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 assessment team, and the results from validating the identified criteria.

Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of Applus+ Certification.

The composition of audit team shall be approved by 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 shall be covered by the assessment team.

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

The complete list of CVs is included as Appendix 2 of this report.

Document review

The Project Design Document submitted by the Client was reviewed against the approved methodology 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 like 3rd party Government documents has been done. A complete list of all documents and evidence material reviewed is included in Appendix 3 of this report.

Follow-up interviews

A site visit is conducted by 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 section C.2 and C.3 of this report.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the validation process, the concerns raised and responses given are summarized in Appendix 4 below.

The final PDD version 04 submitted by PP on 18/09/2019 serves as the basis for the final assessment presented. Additional changes to the project during the validation process are not considered to be significant with respect to the main CDM objectives. The two CDM 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 validation of the final documentation including the validation 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 assessment team approval can only be given by the other one to avoid any conflict of Interest.

After confirmation of the PP the validation opinion and relevant documents are submitted to the EB through the UNFCCC web-platform.

Conclusion

Applus+ Certification has performed a validation of the “Grid Connected Wind Power Project by M/s Giriraj Enterprises in Madhya Pradesh”. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria, e.g. AMS-I.D. version 18, given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided Applus+ Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by Applus+ Certification for registration with the UNFCCC.

Applus+ Certification has received a confirmation from the host Party that the project activity assists it in achieving sustainable development.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the positive list of renewable project demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of annual emission reductions of 23,915 tCO₂e.

The validation has been performed following the requirements of the latest version of the CDM VVS version 02 and on the basis of the contractual agreement. The single purpose of this report is its use during the registration process as part of the CDM/UNFCCC project cycle.

SECTION B: Validation team, technical reviewer and approver**B.1 Validation 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/document review	On-site inspection	Interview(s)	Validation findings
1.	Lead Auditor/ Technical Expert	OR	KUMAR	PANKAJ	True Quality Certifications Private Limited- Outsourced entity	YES	YES	YES	YES

B.2 Technical reviewer and approver of the validation report for RCP

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	EI	Shen	Simon	Applus+ Certification
2.	Approver	IR	Sendín Caballero	Juan	Applus+ Certification

SECTION C : Means of validation**C.1 Desk/document review**

The details of the document observed during desk review /validation process are listed below in Appendix 3 of this report.

C.2. On-site inspection

Duration of on-site inspection: 30/08/2019					
No.	Activity performed on-site	Site location	Date	Team member	
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring.	The project is located at: Village: Barda Barkheda, Taluka: Barod, District: Shajapur, Madhya Pradesh in India.	30/08/2019	Mr. Pankaj Kumar	

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Bankar	Kailas	Senior	30/08/2019	As explained	Mr. Pankaj Kumar

			Manager- D.J. Malpani		in section C.2	
2	Rao	Anjali ¹	Project Manager - Enking International (Consultant)	30/08/2019	As explained in section C.2	Mr. Pankaj Kumar

C.4 Sampling approach

The assessment team did not apply any sampling approach for the project activity. The site visit was conducted for complete power plant implemented in the locations as mentioned in the PDD.

C.5 Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	00	01	00
Application and selection of methodologies and standardized baselines	01	00	00
Validity of original baseline or its update	00	01	00
Estimated emission reductions or net anthropogenic removals	00	01	00
Validity of monitoring plan	00	00	00
Crediting period	00	01	00
Project participants	00	00	00
Post-registration changes	00	00	00
Others (Environmental benefits)	00	01	00
Total	01	05	00

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	Assessment team checked the PDD version 11 forms supplied by the project participant and found that the latest form applicable in the UNFCCC web site is used for the presentation of the PDD.				
Findings	CAR 01 was raised during the validation process and closed successfully.				
Conclusion	<p>The PDD mentions all the criteria as detailed out in PDD form version 11.0 properly and found correct by the assessment team.</p> <p>The project activity is grid-connected wind power generation to produce clean electricity by utilizing kinetic energy of wind. The total capacity of the project activity is 15 MW (10 WTGs × 1.50 MW). The project activity employs Wind Turbine Generators (WTGs) of Class S-82 manufactured by M/s. Suzlon Energy Limited. The project activity will supply the generated electricity to NEWNE Grid of India. Wind power is renewable energy and can be used continuously without depletion of raw material used for power generation.</p> <p>Assessment team also checked the commissioning details and found the same to be correct. The actual commissioning dates are checked from the 3rd party Government documents and found to be accurate.</p> <p>The technical details were checked by the assessment team from the details available from the manufacturers and also during the onsite visit. The details are as below:</p> <table border="1"> <tr> <td>1.</td><td>Main Data</td></tr> <tr> <td></td><td>Turbine type Horizontal axis turbine</td></tr> </table>	1.	Main Data		Turbine type Horizontal axis turbine
1.	Main Data				
	Turbine type Horizontal axis turbine				

¹ Assesment team discussed via telephone call with Mrs. Anjali regarding the clarification of CAR/CL raised. She also accompanied us for the site visit.

	Rated Power	1500 kW
	Rotor Diameter	82 m
	Hub height (including foundation)	Approximately 78.5 m
	Rotational Speed	15.6 to 18.4 rpm
2.	Rotor	
	Number of rotor blades	3
	Rotor Orientation	Upwind
	Material	Epoxy bonded fiber glass
3.	Gear Box	
	Type of Gear Box housing	One planetary stage / Two helical stages
	Ratio	1: 95.09
	Type of cooling	Forced oil cooling lubrication system
4.	Generator System	
	Generator type	Single speed induction generator with slip rings, variable rotor resistance via Suzlon Flexi slip system
	Rated power	1500 kW
	Speed at rated power	1511 rpm
	Rated voltage	690 V AC (phase to phase)
	Frequency	50 Hz
	Insulation Class	Class H
5.	Tower	
	Tower type	Tubular tower (corrosion proof painting on inner and outer surface) with welded steel plates
	Tower Height	76 m
6.	Operational Parameters	
	Cut-in wind speed	4 m/s
	Rated wind speed	14 m/s
	Cut-off wind speed	20 m/s
	Survival wind speed	52.5 m/s

Power evacuation

The project metering point/s further evacuates the electricity to the substation. The substation provides respective feeder-wise back- up metering(check meters) facility. These check meters are having accuracy class of 0.2s.The monthly JMR is taken by the representative of PP & State Utility.

Assessment team checked the geographical coordinate of the project activity with GPS meter and cross checked the same with the google Map. The latitude and longitude as mentioned in the registered PDD for 1st crediting period is found correct. The details are as below:

The exact project location is as under:

The project is located at: Village: Barda Barkheda

Taluka: Barod

District: Shajapur

State: Madhya Pradesh

Country: India (Host Party)

Sr. No.	Location Nos.	WTG Capacity, MW	Survey no.	Date of Commissioning	Latitude	Longitude
1.	M-12	1.5	1723	31/03/2011	N 23° 51' 55.2"	E 76° 03' 47.5"
2.	M-34	1.5	1403	28/03/2011	N 23° 51' 05.2"	E 76° 03' 39.7"
3.	M-35	1.5	1394	28/03/2011	N 23° 50' 53.8"	E 76° 03' 42.0"
4.	M-36	1.5	1349	28/03/2011	N 23° 50' 45.1"	E 76° 03' 54.6"
5.	M-45	1.5	877	30/03/2011	N 23° 50' 25.2"	E 76° 04' 09.6"
6.	M-55	1.5	998	19/06/2011	N 23° 48' 39.7"	E 76° 05' 11.9"
7.	M-90	1.5	177	07/06/2011	N 23° 50' 05.0"	E 76° 05' 26.5"

8.	M-91	1.5	227	19/06/2011	N 23° 49' 56.9"	E 76° 05' 33.9"
9.	M-92	1.5	227	19/06/2011	N 23° 49' 44.7"	E 76° 05' 38.5"
10.	M-93	1.5	227	19/06/2011	N 23° 49' 34.6"	E 76° 05' 25.5"
Total Capacity		15 MW				

No post registration changes is envisaged for the 2nd CP as the project is implemented as per the registered PDD of 1st CP and in continuous operation apart from scheduled maintenance (as per manufacturer specification) and thus there is no scenario observed which can alter the requirement of the methodology. The project activity complies with the applicability criteria of the large scale CDM Project activity category. The capacity of the proposed project is 15 MW, which qualifies for Type I small scale projects. Thus the project qualifies as small scale project. There is no change in installed capacity of the project as mentioned in registered PDD for 1st CP. The same is checked by the assessment team during onsite visit and found correct.

D.2. Application and selection of methodologies and standardized baselines

Means of validation	<p>The assessment team has validated the documentation referred to in the revised PDD for renewable of crediting period and verified the documentation content for verifying the justification of the applicability of the methodology AMS-ID version 18.0 and confirmed that the documentation referred to in the PDD is correctly quoted and interpreted. The assessment team has also cross-checked the information provided in the registered PDD of 1st CP with the documentation other than from the PDD based on the local and sectoral knowledge of the assessment team. Following documentation has been reviewed by the assessment team:</p> <ul style="list-style-type: none"> - Site visit - Interview with the concerned person mentioned in this report - Technical detail analysis of the power plant from the documents submitted by the manufacturer. - Commissioning certificates of the turbines <p>The assessment of the project's compliance with the applicability criteria of AMS-I.D version 18.0 are documented in detail in section B.2 of the PDD.</p>
Findings	<p>Applicability criteria were explained properly as per the requirement of the applied approved methodology for the present crediting period. However CL 01 was raised during the validation process and closed successfully.</p>
Conclusion	<p>The applied baseline methodology is justified as it has been demonstrated that the proposed project activity is:</p> <p>Applicability 1: The project activity is a Renewable Energy Project i.e. Wind Power Project which falls under applicability criteria option 4(a) i.e., "Install a Greenfield plant;". Hence the project activity meets the given applicability criterion.</p> <p>Applicability 2: The 1st and 3rd option of Table of AMS I.D. Version 18, is applicable.</p> <p>Applicability 3: The project is installation of new wind based electricity generation plants (not addition to existing system). Option (a) is applicable.</p> <p>Applicability 4: The project is wind power project and thus the criterion is not applicable to this project activity.</p> <p>Applicability 5: The project activity is 15 MW wind electricity generation. Unit does not co-fire fossil fuels. Hence the criterion is not applicable to the project activity.</p> <p>Applicability 6: The Project activity is a renewable wind energy project and is not a combined heat and power system. Hence the criteria is not applicable to the project activity</p> <p>Applicability 7: The project activity is Greenfield and there is no existing power generation facility at the site. Hence the criteria is not applicable to the project activity</p>

	<p>Applicability 8: Not applicable, the wind project is a Green field project activity and this project is not the enhancement or up gradation project.</p> <p>Applicability 9: The Project activity is a renewable wind power project and is not a landfill gas, waste gas, waste water treatment and agro-industries projects or recovered methane emissions project. Hence the criteria is not applicable to the project activity</p> <p>Applicability 10: The Project activity is a renewable wind power project and is not a biomass project. Hence the criterion is not applicable to the project activity.</p> <p>(Applus+ Certification) confirms that the application of the baseline methodology is transparent and conservative and confirms that the chosen baseline and monitoring methodology i.e. AMS-I.D. version 18.0 is applicable to the project activity.</p> <p>The total installed capacity of project activity is 15 MW which is applicable as per small scale project activities methodology AMS-I.D. version 18.0. The project capacity will be always remain the same and hence the project activity will always be small scale project activity throughout the 2nd crediting period and thereafter.</p>
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D.3. Validity of original baseline or its update

Means of validation	The baseline scenario as depicted in the PDD version 04 is checked during the validation site visit and also during the interview with the plant official.
Findings	The baseline is selected as per the requirement of the approved methodology AMS I.D. version 18.0 for the present Crediting period. However, CL 01 was raised during the validation process and closed successfully.
Conclusion	<p>Assessment team referred "Methodological tool (EB 66, Annex 47) "Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period." (Version 03.0.1)" and VVS version 02 for the project activity" to check the originality of the baseline. Following are the observation of the assessment team regarding selected baseline for the project activity in this present 2nd renewable crediting period:</p> <p><u>Step 1.1 (EB 66, Annex 47): Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies</u></p> <p>The baseline for the project activity is the electricity delivered to the grid by the project activity which would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid. The project activity is claiming the emission reductions from the net exported electricity to the grid only. In absence of project activity this quantity of electricity would have been generated from the electricity grid mix (mainly fossil fuel). The Government of India enacted the Electricity Act in the year 2003 to harmonize and rationalize the provisions in the then existing laws. The Act consolidated the laws relating to generation, transmission, distribution, trading and use of electricity. With the Enactment of the act, the then existing laws viz, The Indian Electricity Act 1910, The Electricity Supply Act, 1948 and The Electricity Regulatory Commissions Act, 1998 were repealed. The Electricity Act 2003 was in force at the time of the completion of the baseline study during first crediting period.</p> <p>The baseline remains unchanged for the present crediting period since there is no policy been revised and/or is currently in force as well, therefore the baseline scenario is still in compliance with all the relevant mandatory national and/or sectoral policies.</p> <p><u>Step 1.2 (EB 66, Annex 47) : Assess the impact of circumstances</u></p> <p>There are no new circumstances that can impact the original baseline. The baseline emission factor value is however updated based on the current data available for the grid.</p>

Step 1.3 (EB 66, Annex 47): Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

As explained in step 1.2, the baseline scenario was the electricity import/generation from the power plants connected to the electricity grid. Therefore this condition is not applicable to the project activity.

Step 1.4(EB 66, Annex 47): Assessment of the validity of the data and parameters

This step stipulates that “Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity.”

The project chosen **ex-ante default value i.e. Emission Factor**. As per the Guidance given in Tool the emission factor is updated as follows:

1. The operating margin is calculated as per the latest version of CEA (Version 14) available to the project participant. The operating margin calculation is checked by the assessment team and found correct.
2. The build margin is considered from CEA database version 14 as per “Tool to calculate the emission factor for electricity system” version 07. The value considered is checked by the assessment team and found correct
3. The Combined margin calculation is carried out as per “Tool to calculate the emission factor for electricity system” version 07. The value considered is checked by the assessment team and found correct

The emission factor is fixed ex-ante and thus will be used for the complete 2nd renewable crediting period and for entire verification conducted under 2nd renewable crediting period.

Application of Steps 1.1, 1.2, 1.3 and 1.4 confirmed that the current baseline is valid for the Second crediting period but data and parameters needs to be updated. Therefore step 2 is used

Step 2.1: Update the current baseline

This step is applicable since the Steps 1.1, 1.2, 1.3 and/or 1.4 showed that the current baseline needs to be updated. As evident from the explanation provided above the baseline scenario remains unchanged.

Updated the baseline emissions based on the latest approved version of the methodology applicable to the project activity for the subsequent crediting period, without reassessing the baseline scenario.

Step 2.2: Update the data and parameters

The updated Data and/or parameter are followed for estimating the baseline emissions

Hence as per AMS I.D. version 18.0 (latest Methodology), the baseline of the project is as follows:

Project activity is the installation of a Greenfield power plant, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

	The above selected baseline is correct and thus applicable to the project activity and in line with approved methodology
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D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	The emission reduction sheet, CEA database version 14.0 (Latest applicable) and PDD version 06 is checked by the assessment team.
Findings	CAR 2 and CAR 3 raised in this section and closed successfully during validation.
Conclusion	<p>The baseline emissions as discussed in section B.6.1 will include emissions that would have occurred in the absence of the project activity. The emission reduction calculation has been done as per the ACM 0002 version 19.0</p> <p>Baseline Emission (BE_y):</p> $BE_y = EGBL_y \times EF_{grid,CM,y}$ <p>Where:</p> $BE_y = \text{Baseline emissions in year } y \text{ (t CO}_2\text{/yr)}$ $EGBL_y = \text{Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year } y \text{ (MWh/yr)}$ $EF_{grid,CM,y} = \text{Combined margin CO}_2 \text{ emission factor for grid connected power generation in year } y \text{ calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO}_2\text{/MWh)}$ <p>PP has estimated the baseline energy generation considering the capacity of the project activity, yearly generation hour and plant load factor. The project activity involves installation of 15 MW grid connected wind power plant in the state of Rajasthan. Validation team assessed the technical specification of the promoters of the project activity, Commissioning certificate and found that installed capacity of this project activity is correct.</p> <p>Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors according to the procedure prescribed in the "Tool to calculate the emission factor for an electricity system" version 07.0 which is sourced from CEA version 14.0, Govt. of India and forms the part of emission reduction calculation. The baseline emission factor calculation is checked by the validation team and found that the calculation is transparent and conservative.</p> $BE_y = 25,529 \times 0.9368 = 23,915 \text{ tCO}_{2e}$ <p><u>Project Emissions:</u> As per the latest applied methodology for wind power project PE_y = 0.</p> <p><u>Leakage Emissions:</u> As per the Methodology requirement Leakage emission is not applicable for renewable project.</p> <p><u>Emission Reductions:</u> The project activity reduces carbon dioxide emissions through displacement of grid electricity generation with predominantly fossil fuel based power plants² by renewable electricity. The emission reduction (ER_y) due to project activity during a given year y is calculated as the difference between baseline emissions (BE_y), project emissions (PE_y) as per the formulae given below:</p> $ER_y = BE_y - PE_y$

	$ER_y = 23,915 \text{ t CO}_{2e} - 0 \text{ t CO}_{2e}$ $ER_y = 23,915 \text{ (Rounded Down)}$
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D.5. Validity of monitoring plan

Means of validation	Assessment team checked the monitoring practice onsite and also checked the requirement of AMS I.D., version 18 and procedure mentioned in the registered PDD of 1 st CP.
Findings	CAR 3 and CAR 4 raised during validation and resolved successfully.
Conclusion	<p><u>Parameters determined ex-ante:</u></p> <ol style="list-style-type: none"> $EF_{grid,OM,y} : = (0.9610 \text{ tCO}_2/\text{MWh})$ = Operating Margin emissions factor for grid connected power generation in year y calculated using the latest version of “Tool to calculate the emission factor for an electricity system version 07.” $EF_{grid,OM,y}$ is computed using the Simple Operating margin CO₂ emission factor. Simple Operating margin CO₂ emission factor is calculated from 3-year generation weighted average using data for the years 2015-2016, 2016-2017 & 2017-18 CO₂ emissions per unit net electricity generation of all power plants serving the system, not including low-cost / must-run. This is in agreement with the guidance provided in the Tool to calculate the emission factor for an electricity system. The value is considered from CEA version 14. The value is fixed ex-ante for the entire duration of 2nd crediting period. As the value is sourced from CEA (publicly available document) no further analysis is required $EF_{grid,BM,y} = (0.8644 \text{ tCO}_2/\text{MWh})$ Build Margin emissions factor for grid connected power generation in year y calculated using the latest version of “Tool to calculate the emission factor version 07 for an electricity system. Build margin emission factor is the generation-weighted average emission factor of all power plants <i>m</i> during the most recent year <i>y</i> for which generation data is available. The value is considered from CEA version 14. The value is fixed ex-ante for the entire duration of 2nd crediting period. As the value is sourced from CEA (publicly available document) no further analysis is required $EF_{grid,CM,y} := (0.9368 \text{ tCO}_2/\text{MWh})$ Combined Margin emissions factor for grid connected power generation in year y calculated using the latest version of “Tool to calculate the emission factor for an electricity system version 07.” Combined Margin is computed using the official data sources and is in-line with the guidance provided in the tool. The value is considered from CEA version 14. The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ Where: $EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh) $EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM} = Weighting of build margin emissions factor (%) = 25% <p>The above weighing is as per “Tool to calculate the emission factor for an electricity system”, version 07.0.0 for other projects (Wind in this case) and for second crediting period. The value is fixed ex-ante for the entire duration of 2nd crediting period. As the value is sourced from CEA (publicly available document) no further analysis is required.</p> <p><u>Parameters determined ex-post:</u></p> <p>$EG_{BL,y}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)</p>

	<p>The value for the parameter will be sourced from the primary source i.e. Monthly Meter Reading Reports developed by the State board. The Certificate for share of electricity as given by State board provides the Values of Net electricity supplied by power plant. The practice is as per the registered PDD and approved methodology.</p> <p>The main meter at a given site metering point measures parameters like export & import for all the connected WTGs. The export reading for a given metering point for a given billing month is obtained by subtracting initial reading (taken in previous month) from the final reading (taken in billing month). The difference is multiplied by the applicable meter constant. Similar procedure is followed to arrive the import reading.</p> <p>The monitoring & measurement³ of electricity at project metering point/s is being done on continuous basis; while recording is being done on monthly basis as <i>Joint Meter Reading</i> by the representatives of State Utility & PP.</p> <p>The export & import by the project activity WTG/s connected at a given metering point is calculated by apportioning of the electricity at feeder level by the state utility. The apportioning of the electricity is based on the monthly generation ratio (ratio of controller reading of project activity WTG/s to the controller reading for all WTGs connected to the applicable metering point) at the given metering point and the electricity reading (export, import etc) recorded by the main meter at the given metering point on monthly basis. It gives monthly values of export & import for project activity WTG/s. The net export for any given month by the project activity WTG/s to the grid is then obtained by subtracting import from export.</p> <p>Thus, $\text{Net Export} = \text{Export kWh} - \text{Import kWh}$</p> <p>These energy meters (type: tri-vector) are having accuracy class of 0.2s. The monthly JMR is taken by the representative of PP & State Utility. The meters are approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. The calibration of all the meters will be undertaken at required intervals (once in five years as per CEA notification⁴) and faulty meters will be duly replaced immediately. The meter accuracy class and calibration interval is under purview of state electricity board and PP do not have any control on it. DoE confirmed that apportioning procedure is under control of state electricity board and PP do not have any control on it. In the absence or delay in meter calibration — appropriate guideline will be applied to confirm the conservativeness of emission reductions.</p> <p>The Invoice will be used for cross check the Net electricity value and thus is per the requirement of Methodology and registered PDD of 1st CP. The same practice is followed onsite as mentioned in registered PDD of 1st CP and thus it is acceptable to the DOE.</p>
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D.6. Crediting period

Means of validation	The crediting period is checked as per UN home page (reference number : 5938) and discussion with Client.
Findings	CAR 04 raised during the validation period and closed successfully
Conclusion	This is 2 nd renewable crediting period and the duration is 7-year renewable (2 nd CP duration: 20/08/2019 to 19/08/2026).

³The meters are capable of measuring the electricity parameters (export, import etc.) on real time basis. It complies the hourly measurement requirement as per the monitoring methodology.

⁴ http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf

D.7. Project participants

Means of validation	The project participant names were checked from UN homepage https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1332514604.99/view		
Findings	No findings raised		
Conclusion	Following are the details of PP (host country) and Annex 1 country. The same is correct and in line with PDD registered under 1st Crediting period as well as MOC obtained from UN home page. The details are true for the 2 nd Crediting period as well.		
	Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
	India (host)	M/s. Giriraj Enterprises (Private)	No

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents ⁵	N	NA	NA
Corrections	N	NA	NA
Change to the start date of the crediting period	N	NA	NA
Inclusion of a monitoring plan	N	NA	NA
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N	NA	NA
Changes to the project design	N	NA	NA
Changes specific to afforestation and reforestation project activities	N	NA	NA

SECTION E. Internal quality control

As final step of a validation of the final documentation including the Renewable crediting period validation 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 assessment team approval can only be given by the other one to avoid any conflict of Interest.

SECTION F. Validation opinion

Applus+ Certification has performed a validation of the “Grid Connected Wind Power Project by M/s. Giriraj Enterprises in Madhya Pradesh”. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria, e.g. AMS I.D version 18.0, given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided Applus+ Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by Applus+ Certification for registration with the UNFCCC.

⁵ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

Applus+ Certification has received a confirmation from the host Party that the project activity assists it in achieving sustainable development.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the positive list of renewable project demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of annual emission reductions of 23,915 tCO₂e.

The validation has been performed following the requirements of the latest version of the CDM VVS version 02 and on the basis of the contractual agreement. The single purpose of this report is its use during the registration process as part of the CDM/UNFCCC project cycle.

Appendix 1. 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
CMS	Central Monitoring system
CP	Crediting period
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
ER	External Resource
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
NRED	New and Renewable Energy Department, M.P.
MPUVNL	Madhya Pradesh Urja Vikas Nigam Ltd.
IR	Internal Resource
OR	Outside resource
OEM	Original Equipment manufacturer
OM	Operating Margin
PP	Project Participant

Appendix 2. Competence of team members and technical reviewers

Pankaj Kumar worked as team leader – Bihar for South Asia Climate Proofing and Growth Development(CPGD) – Climate Change Innovation Programme (CCIP) supported by DFID that seeks to mainstream climate change resilience into planning and budgeting at the national and sub-national level in India, Pakistan, Nepal, Afghanistan and Bangladesh. Pankaj Kumar has worked previously with IL&FS Infrastructure Development Corporation and BUIDCO(Bihar Urban Infrastructure Development Corporation), Govt. of Bihar as Environmental Specialist for WB & ADB funded projects. Prior to this, he worked with

Carbon Check (UNFCCC accredited DoE), Johannesburg, RSA as Team Leader for validation, verification of around 100 GHG projects in Asia, Africa, USA, Asia Pacific & Americas. Pankaj is accredited Lead Auditor, Validator, Verifier and Technical Expert for Sectoral Scope/Technical Area – 1.1, 1.2, 3.1 & 13.1 by UNFCCC DoE (Designated Operational Entity), APPLUS, Spain. He is also member of task force on climate change & human health, Health Department, GoB and on roster of UNICEF WASH experts.

He is an experienced, qualified and result oriented Environment Professional having more than 14 yrs. of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Validation and Verification of GHG project under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He provides technical support for environmental investigative, consultative and remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing

Pankaj Kumar is Masters in Environment Management from Forest Research Institute (University), I.C.F.R.E, Dehradun, which is Centre of Excellence in South East Asia for Forestry education & research and PGDEL from National Law School of India University, Bangalore (India).

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 5 years

Appendix 3 : Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	NA	Contract of the project participant with the DOE	Contract document signed between PP and DOE	Project participant
2	NA	Technical specifications of WTGs and other equipments	Manufacturer technical specifications	Project participant
3	NA	1st PDD version 01 PDD based on which opinion is provided- Version 04	16/08/2019 18/09/2019	Project participant
4	NA	Estimated Emission reduction calculation sheet- version 01	16/08/2019	Project participant
5	NA	AMS I.D. version 18	UNFCCC CDM web site	UNFCCC
6	NA	Ministry of Environment and forest: www.envfor.nic.in UNFCCC www.cdm.unfccc.int	Reference link is provided.	Independent Search

		CEA: Central electricity authority www.cea.nic.in		
7	NA	<p>Tools/ guidelines used in the project activity:</p> <ul style="list-style-type: none"> • Clarification on national and/or sectoral policies Para 27 EB 55. • Tool to determine the remaining lifetime of the project activity in line with Annex 15 EB 50. • Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion, Version 3. • Tool to calculate the emission factor for an electricity system version 07. • Glossary of CDM terms version 09.1. • Guideline for completing the PDD form for small scale CDM project activity version 11. • Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period." (Version 03.0.1). 	UNFCCC CDM web site	UNFCCC
8	NA	Commission Certificate for Wind Power plant	Commissioning certificate as provided by 3 rd party	Project participant
9	NA	Power purchase agreement	PPA signed between PP and State electricity board	Project participant

Appendix 4 : Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	01	Section no.	Date: 05/09/2019
Description of CL			
PP shall clarify, how Section B.4 of the PDD is in Compliance with EB 66 Annex 47 (Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period)			

Project participant response	Date: 12/09/2019
The above comment has been addressed in the updated PDD	
Documentation provided by project participant	
PDD V4	
DOE assessment	Date: 18/10/2019
PP has provided description on assessment of the validity of the original/ current baseline at the time of renewal of crediting period in sec. B.4 of the revised PDD, Ver.04 dated 18/09/2019 and DoE concludes that description provided is in compliance with EB 66, Annex 47. Comment closed	

Table 2. CAR from this validation

CAR ID	01	Section no.	A.1	Date: 05/09/2019
Description of CAR				
In section A.1, GHG reduction value is not consistent with ER sheet. In same section, NEWNE grid replaced by Indian grid. PP shall maintain consistency in the name of grid through out the PDD.				
Project participant response				Date: 12/09/2019
The value of GHG reduction has now been corrected and updated. Also, the Indian grid has now been maintained in a consistent manner				
Documentation provided by project participant				
PDD V4				
DOE assessment				Date: 18/10/2019
The value of GHG reduction corrected in sec. A.1 of revised PDD, ver. 4 dated 18/09/2019 which is now consistent with ER sheet. PP has also now made correction in this section to maintain consistency of nomenclature of grid. Comment closed				

CAR ID	02	Section no.	B.4	Date: 05/09/2019
Description of CAR				
In sec. B.4, value of BM is not consistent with ER sheet				
Project participant response				Date: 12/09/2019
Value of BM in sec. B.4 has now been updated in PDD V4				
Documentation provided by project participant				
PDD V4				
DOE assessment				Date: 18/10/2019
PP has now corrected value of BM in sec. B.4 of revised PDD, ver. 04 dated 18/09/2019. Comment closed				

CAR ID	03	Section no.	B.6	Date: 05/09/2019
Description of CAR				
In sec. B.6.1, under step 6, value of $EG_{BL,y}$ is not consistent with ER sheet. Corrective action required				
Project participant response				Date: 12/09/2019
Value of $EG_{BL,y}$ has now been updated in PDD V4				
Documentation provided by project participant				
PDD V4				
DOE assessment				Date: 18/10/2019
Value of $EG_{BL,y}$ is now corrected in sec. B.6.1 of revised PDD, ver. 04 which is now consistent with ER sheet. Comment closed.				

CAR ID	04	Section no.	C	Date: 02/09/2019
Description of CAR				
The start date of the 2 nd crediting period is incorrect. Corrective action is sought in section C.3.2 of the PDD.				
Project participant response				Date: 08/09/2019
Modifications regarding 2 nd crediting period have been made in the section C.3.2 of the revised PDD, ver.04 dated 18/09/2019				
Documentation provided by project participant				
PDD V4				

DOE assessment	Date: 18/10/2019
Start date of 2 nd crediting period corrected in revised PDD, Ver. 04 which is in line with para 412 of CDM VVS,ver.02. Comment closed	

CAR ID	05	Section no.	D	Date: 05/09/2019
Description of CAR				
In sec. D.1, latest EIA notification of 2018 not referred. Corrective action required.				
Project participant response				Date: 13/09/2019
Sec. D.1 of the PDD has been updated with the latest EIA notification.				
Documentation provided by project participant				
PDD V4				
DOE assessment				Date: 18/10/2019
Sec. D.1 of revised PDD, ver. 04 now updated by giving reference to latest EIA notification. Comment closed				

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN) and version 02.0 of the “CDM project cycle procedure for project activities” (CDM-EB93-A06-PROC);• Make editorial improvements.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Renewal of crediting period Keywords: crediting period, project activities, validation report		