




**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 | 9 MW Wind Energy Farm at Jodhpur Rajasthan by HZL (UNFCCC Ref. no. 8103) ¹ |
| Number and duration of the next crediting period | 2 nd renewable crediting period 01/12/2020 to 30/11/2027 |
| Version number of the validation report | 02 |
| Completion date of the validation report | 15/12/2020 |
| Version number of PDD to which this report applies | 4.0 |
| Project participants | M/s Hindustan Zinc Limited (India) EKI Energy Services Limited (Australia) |
| Host Party | India |
| Applied methodologies and standardized baselines | AMS-I.D. "Grid connected renewable electricity generation" Version 18 Standardized baselines – Not Applicable |
| Mandatory sectoral scopes | Scope 1: Energy Industries (renewable-/non-renewable sources) |
| Conditional sectoral scopes, if applicable | NA |
| Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period | 14,740 tCO ₂ e |
| 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:  |

¹ <https://cdm.unfccc.int/Projects/DB/DNV-CUK1352368307.07/view>

SECTION A. Executive summary

HZL (M/s Hindustan Zinc Limited) supports implementation of a 9 MW wind power project consisting of 6 Wind Turbine Generators (WTGs) of individual capacity 1.5 MW sourced from Suzlon Energy Limited at Osiyan in Rajasthan, India. The project activity is in line with the sustainable development priority of the country. This project aims at providing electricity to the regional electricity grid through effective utilization of renewable resource which, in the case of the project activity, is wind power. The project was commissioned on 28/03/2011.

The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources and to contribute to climate change mitigation efforts. In the absence of the project activity, the electricity thus supplied would have been generated through fossil fuel based thermal power plants. The project activity thus contributes to reduction in specific emissions (emissions of pollutant) including GHG emissions. The project activity is also responsible for sustainable economic growth and conservation of environment through use of wind energy as a renewable source. Total projected annual electricity generation from the wind energy project unit to the grid is 15,650 MWh/year. The annual estimated GHGs emissions reductions from this project activity are 14,740 tCO₂ e.

As the proposed activity is a Greenfield activity and 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 in the grid

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. ver. 18. The validation was based on the requirements in the CDM validation and verification standard for project activities, version 02.

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 “CDM validation and verification standard for project activities, version 02 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. Denny Xue | 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

The site visit at validation for the project activity is not conducted in line with the para 30 of VVS-PA, Ver. 02.0, Applus+ Certification performed interviews, telephone conferences, and interview 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 4.0 submitted by the PP on 24/11/2020 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 the validation of the “9 MW Wind Energy Farm at Jodhpur, Rajasthan”. 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 fulfilment 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 14,740 tCO₂ e.

The validation has been performed following the requirements of the latest version of the CDM validation and verification standard for project activities, Version 02.0 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 | Remote audit | 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 | Xue | Denny | 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

As per the requirement of Para 30 of CDM Validation and Verification Standard (VVS) for project activities, Version 02.0, Para (a) since the emission reduction estimated is less than 100,000 tCO_{2eq}, assessment team didn't conduct the site visit for 2nd renewal of registered PA (UNFCCC reference number: 8103). To validate the PA design, eligibility criteria, monitoring & management practices as mentioned in the PDD; assessment team has conducted telephonic interviews with PP in compliance with para 31 of VVS for project activities, Ver. 02.0. After telephonic interviews with concerned PP representative; assessment team concluded that the design of PA is same as envisaged in 1st CP. There is no change in the eligibility of PA design or operation and monitoring practices as mentioned in the registered PA of 1st CP which can alter the applicability or additionality of the project activity/methodology applied i.e. AMS.I.D Version 18. Assessment team therefore of the opinion that project is will be implemented as described in the registered PDD for 1st crediting period and no change is envisaged for the proposed 2nd crediting period.

| Duration of on-site inspection: DD/MM/YYYY to DD/MM/YYYY | | | | |
|--|----------------------------|---------------|------|-------------|
| No. | Activity performed on-site | Site location | Date | Team member |
| NA | NA | NA | NA | NA |

C.3. Interviews

| No. | Interviewee | | | Date | Subject | Team member |
|-----|-------------|------------|-------------------|------------|--|------------------|
| | Last name | First name | Affiliation | | | |
| 1. | Gupta | Sandeep | PP representative | 15/06/2020 | PA design, monitoring & management practices of the PDD, eligibility criteria of applied methodology Relevance of baseline scenario. | Mr. Pankaj Kumar |
| 2. | Das | Kingshuk | Consultant | | | |

C.4. Sampling approach

The assessment team did not apply any sampling approach for the project activity.

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 | 00 | 00 | 00 |
| Validity of original baseline or its update | 00 | 01 | 00 |
| Estimated emission reductions or net anthropogenic removals | 00 | 00 | 00 |
| Validity of monitoring plan | 00 | 00 | 00 |
| Crediting period | 00 | 00 | 00 |
| Project participants | 00 | 00 | 00 |
| Post-registration changes | 00 | 00 | 00 |
| Others (EIA) | 00 | 01 | 00 |
| Total | 00 | 03 | 00 |

SECTION D. Validation findings**D.1. Compliance with PDD form**

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|----------------------------|--|
| Means of validation | Assessment team checked the PDD Version 11.0 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 | No findings were raised in this section during validation |

Conclusion

The PDD mentions all the criteria as detailed out in PDD form Version 11.0 properly and found correct by the assessment team.

The project activity implemented 9 MW wind power project consisting of 6 WTGs of individual capacity 1.5 MW sourced from Suzlon Energy Limited at Osiyan in Rajasthan, India The electricity generated from the wind farm is exported to the regional electricity grid and sold to the state electricity utility thereby marginally contributing to reducing the energy demand supply gap in the state of Rajasthan, diversification of grid supply and reduce greenhouse gas emissions.

The technology consists of S 82 - 1.5 MW, 50 Hz Wind Turbine Generator (WTG) The technical data of the equipment are as follows:

| | |
|-----------------|---------|
| Rated capacity: | 1500 kW |
| Rotor diameter: | 82 m |
| Hub height: | 78.5 m |

Rotor with Pitch Control

| | |
|-------------------|--|
| Type: | Upwind rotor with active pitch control |
| Number of blades: | 3 |
| Swept area: | 5281 m² |
| Blade material: | The rotor blades are made epoxy bonded fibre glass |
| Rotor speed: | 16.30 rpm |
| Tip speed: | 70 m/s |

Generator:

| | |
|-----------|---|
| Type: | Single fed Induction Generator with slip - rings, variable rotor resistance with SUZLON - FLEXI - SLIP control system |
| Hub: | Cast spherical hub |
| Bearings: | Spherical roller bearing |
| Tower: | Steel Tubular, 76 m height |

By replacing the electricity of the regional grid, which is heavily dominated by fossil fuel fired power plants; with electricity generated from wind power project activity will achieve obvious greenhouse gas (GHG) emission reductions by avoiding CO₂ emissions. Assessment team also checked the commissioning details on 28/03/2011 and found the same to be correct. The actual commissioning date checked from the 3rd party Government documents and found to be accurate.

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 of six 1.5 MW wind turbines in the district Jodhpur in the state of Rajasthan, India as mentioned in the registered PDD for 1st crediting period is found correct. The exact location of the individual WTGs is as under:

| Sr. No. | WTG No. | Latitude | Longitude |
|---------|---------|----------------|----------------|
| 1 | OS – 58 | N26° 44' 24.9" | E72° 58' 45.8" |
| 2 | OS – 57 | N26° 44' 36.1" | E72° 58' 39.0" |
| 3 | OS – 56 | N26° 44' 38.0" | E72° 58' 22.6" |
| 4 | OS – 54 | N26° 44' 25.2" | E72° 57' 58.8" |
| 5 | OS – 51 | N26° 44' 24.8" | E72° 57' 20.9" |
| 6 | OS – 50 | N26° 43' 49.5" | E72° 57' 13.4" |

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 small scale CDM Project activity category. The capacity of the proposed project is 9 MW, which is not more

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| | than the maximum qualifying Type I capacity of 15 MW. Thus the project qualifies as small scale project. There is no change in installed capacity of the project as mentioned in registered PDD for 1 st CP. The same is checked by the assessment team during telecon with PP and document review and found correct. |
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D.2. Application and selection of methodologies and standardized baselines

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| 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-I.D Version 18 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.</p> <p>Following documentation has been reviewed by the assessment team:</p> <ul style="list-style-type: none"> - Telephonic interview with PP representative and site personnel. - 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 - Monitoring plan details submitted by the PP <p>The assessment of the project's compliance with the applicability criteria of AMS-I.D version 18 are documented in detail in section B.2 of the PDD.</p> |
| Findings | No findings were raised in this section during validation |
| 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 the Table of AMS-I.D. Version 18.0 Appendix 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 9 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> |

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| | <p><u>Applicability conditions of “Tool to calculate the emission factor for an electricity system”</u></p> <ul style="list-style-type: none"> • OM, BM and CM are estimated using the tool for calculating baseline emissions. • The project activity is grid connected and thus emission factor is calculated and thus OM, BM and CM are estimated using the tool for calculating baseline emissions. • The project activity is located in India, a non-Annex I country. Therefore, tool is applicable for the project activity. • The project is a Wind power project and there is no involvement of biofuels. Therefore, this criterion is not applicable for the project activity. <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 9 MW which is applicable as per small scale project activities methodology AMS-I.D. version 18.0. The project capacity will 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

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| Means of validation | The baseline scenario as depicted in the PDD version 4.0 is checked during the validation by means of telecon with PP 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 for the present Crediting period. |
| 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 15) 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 15 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".

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| | 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

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| Means of validation | The emission reduction sheet, CEA database Version 15.0 (latest applicable) and PDD version 04 is checked by the assessment team. |
| Findings | No findings raised. |
| Conclusion | <p>The baseline emissions as discussed in section B.6.1 of the PDD, Version 04.0, will include emissions that would have occurred in the absence of the project activity. The emission reduction calculation has been done as per the AMS I.D. version 18.0.</p> <p>Since the proposed activity is a Greenfield plant, hence as stated in the para 26 of the AMS I.D. version 18.0,</p> $EG_{PJ,Y} = EG_{PJ,facility,y}$ <p>Where:</p> <p>$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)</p> <p>$EG_{PJ,facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)</p> <p>Baseline Emission (BE_y): $BE_y = EG_{PJ,facility,y} \times EF_{grid,y}$</p> <p>Where:</p> <p>$BE_y$ = Baseline emissions in year y (t CO₂/yr)</p> <p>$EG_{PJ,facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)</p> <p>$EF_{grid,y}$ = 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" (t CO₂/MWh)</p> <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 9 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 15.0, 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> $BE_y = 15,650 \times 0.9419 = 14,740 \text{ tCO}_2\text{e}$ <p>Project Emissions: As per the latest applied methodology for wind power project $PE_y = 0$.</p> <p>Leakage Emissions: As per the Methodology requirement Leakage emission is not applicable for wind power project.</p> |

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| | <p>Emission Reductions:</p> <p>The project activity reduces carbon dioxide emissions through displacement of grid electricity generation with predominantly fossil fuel based power plants 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) and leakage emission (LE_y) as per the formulae given below:</p> $ER_y = BE_y - PE_y - LE_y$ $ER_y = 14,740 \text{ t CO}_{2e} - 0 \text{ t CO}_{2e} - 0 \text{ t CO}_{2e}$ $ER_y = 14,740 \text{ (Rounded Down)}$ |
|--|--|

D.5. Validity of monitoring plan

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|----------------------------|--|
| 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 | No findings were raised in this section during validation |
| Conclusion | <p>Parameters determined ex-ante:</p> <ol style="list-style-type: none"> $EF_{grid,OM,y} := (0.9622 \text{ tCO}_2/\text{MWh})$ = 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 CO_2 emission factor. Simple Operating margin CO_2 emission factor is calculated from 3-year generation weighted average using data for the years 2016-2017, 2017-2018 & 2018-19 CO_2 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 15. 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 $EF_{grid,BM,y} := (0.8811 \text{ tCO}_2/\text{MWh})$ 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 m during the most recent year y for which generation data is available. The value is considered from CEA version 15. 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 $EF_{grid,CM,y} := (0.9419 \text{ tCO}_2/\text{MWh})$ 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 15. The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ <p>Where: $EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2/MWh) $EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (tCO_2/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM} = Weighting of build margin emissions factor (%) = 25%</p> <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</p> |

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.

Parameters determined ex-post:

The parameters monitored ex-post involves the following:

1. $EG_{PJ,y}$ or $EG_{PJ, facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
2. $EG_{p\ export,y}$ = Electricity exported to the state electricity board by the project activity; and
3. $EG_{p\ import,y}$ = Electricity imported from state electricity board by the project activity

The value for the parameters will be sourced from the Joint Meter Readings/ Statements on Break-up of Net Export Units prepared by the O&M Service provider. The primary source will be used for emission reduction calculation for the entire duration of 2nd CP. The practice is as per the 1st CP registered PDD and approved methodology.

Since the proposed project is a Greenfield plant; hence as stated in the para 26 of AMS I.D. methodology Version 18.0,

$$EG_{PJ,Y} = EG_{PJ, facility,y}$$

Where:

$EG_{PJ, facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

The quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y is the difference between the measured quantities of the grid electricity export and the import. Energy meters (main meter and check meter) are installed at metering yards at the project site. The meters are electronic tri-vector meters having accuracy class of 0.2s. Five WTGs with location numbers OS 51, OS 54, OS 56, OS 57, and OS 58 are connected to a single metering point and one WTG with location number OS 50 is connected to another metering point. The export and import of electricity would be measured from these onsite meters. These values would be compared with the values provided by Joint Meter Readings/ Statements on Break-up of Net Export Units prepared by the O&M Service provider, and the conservative value of the two would be considered for the emission reduction calculation.

Accepted industry standard : National standard as described in the Power Purchase Agreement.

Measurement equipment : Energy meters

Calibration frequency : once in 3 years

Accuracy of the meters : 0.2 s

Measurement interval : continuous measurement, monthly recording

The energy meters installed will be calibrated on annual basis. The data will be archived electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

The meter accuracy class and calibration interval is under purview of state electricity board and PP does not have any control on it. DoE confirmed that apportioning procedure is under control of state electricity board and PP does 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.

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.

The export and import parameters ($EG_{p\ export,y}$ and $EG_{p\ import,y}$) are monitored using

| | |
|--|---|
| | <p>digital energy meters of 0.2 accuracy class at the sub-station of the state electricity board. Joint meter readings of the energy meters are carried out by representatives of the project promoter and representatives of the state electricity board on a monthly basis.</p> <p>The export readings will be apportioned based on the electricity generation from the individual WTGs connected to the substation. The apportioning procedure is under control of state electricity board and PP does not have any control on it. The PP has the values of export, import and net electricity supplied to grid and the same parameters are considered as monitoring parameters.</p> <p>The measurement results shall be cross checked with the records of invoices raised by the project proponent to the state electricity board for sale of electricity. It is reported that the data will be kept for two years after the crediting period or from last issuance. The values shall be monitored ex-post and CERs will be calculated at actual.</p> <p>The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized, found to be appropriate.</p> |
|--|---|

D.6. Crediting period

| | |
|----------------------------|---|
| Means of validation | The crediting period is checked as per UN home page (reference number: 8103 and discussion with the Client). |
| Findings | No finding raised during validation |
| Conclusion | This is 2 nd renewable crediting period and the duration is 7-year renewable (2 nd CP duration: 01/12/2020 – 30/11/2027). |

D.7. Project participants

| | | | |
|----------------------------|--|---|---|
| Means of validation | The project participant names were checked from UN homepage https://cdm.unfccc.int/Projects/DB/DNV-CUK1352368307.07/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 | M/s Hindustan Zinc Limited (Private Entity) | No |
| | Australia | EKI Energy Services Limited | 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 ² | 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 |

² 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).

| | | | |
|--|---|----|----|
| 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 “9 MW Wind Energy Farm at Jodhpur, Rajasthan”. 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 fulfilment 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 14,740 tCO₂e.

The validation has been performed following the requirements of the latest version of the CDM validation and verification standard for project activities, Version 02.0 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 |
| 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

1. **Mr. 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).

2. **Mr. Denny Xue** (Master Degree in Environmental Engineering, Bachelor Degree in Thermal Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based on Shanghai. He has more than 5 years of work experiences in CDM project development. Before he joined Applus+ LGAI, he has been worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development

3. 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 wind power plant and other equipments | Manufacturer technical specifications | Project participant |
| 3 | NA | 1st PDD version 03 PDD based on which opinion is provided- Version 4.0 | 28/10/2020 24/11/2020 | Project participant |
| 4 | NA | Estimated Emission reduction calculation sheet- version 01 | 24/11/2020 | Project participant |
| 5 | NA | AMS.I.D version 18 | UNFCCC CDM web site | UNFCCC |
| 6 | NA | Ministry of Environment, Forest and Climate Change (MoEFCC): www.envfor.nic.in UNFCCC www.cdm.unfccc.int CEA: Central electricity authority www.cea.nic.in | Reference link is provided. | Independent Search |
| 7 | NA | Tools/ guidelines used in the project activity: <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. 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 |

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

Table 1. Remaining FAR from previous validation

| | | | | |
|--|----|--------------------|--|--------------------------|
| FAR ID | NA | Section no. | | Date : DD/MM/YYYY |
| Description of FAR | | | | |
| | | | | |
| Project participant response | | | | Date :DD/MM/YYYY |
| NA | | | | |
| Documentation provided by project participant | | | | |
| NA | | | | |
| DOE assessment | | | | Date: DD/MM/YYYY |
| NA | | | | |

Table 2. CAR from this validation

| | | | | |
|--|----|--------------------|-----|--------------------------|
| CAR ID | 01 | Section no. | A.1 | Date : 11/11/2020 |
| Description of CAR | | | | |
| <ol style="list-style-type: none"> 1. In Section A.1 and other relevant section of PDD, PP shall reframe the language of the project description as the project is already commissioned and undergoing renewable of crediting period but the language suggests that the Project is proposed. 2. Name of host country DNA is not correct. Corrective action required 3. Weblink provided in footnote 1 is not functional. PP shall provide functional weblink. | | | | |
| Project participant response | | | | Date: 24/11/2020 |
| <ol style="list-style-type: none"> 1. The section A.1 and other sections of PDD are revised considering Project activity is already commissioned. 2. The name of host country DNA has been mentioned as "Ministry of Environment and Forest and Climate Change, Govt. of India" 3. The functional web link of Ministry of Environment and Forest and Climate Change, Govt. of India is mentioned in revised PDD. | | | | |
| Documentation provided by project participant | | | | |
| Revised PDD Version 04 dated 24/11/2020 | | | | |
| DOE assessment | | | | Date: 26/11/2020 |
| <ol style="list-style-type: none"> 1. The PP has modified the language in the revised PDD, Ver. 4.0 dated 24/11/2020, found to be satisfactory, hence accepted. Comment closed 2. The PP has now corrected the name of DNA India in sec. A.1 in the revised PDD, Ver. 4.0 dated 24/11/2020. Comment closed 3. The functional weblink is put in place by the PP in the revised PDD, Ver. 4.0 dated 24/11/2020. Comment closed | | | | |

| | | | | |
|--|----|--------------------|-----------|-------------------------|
| CAR ID | 02 | Section no. | B.4 & B.6 | Date: 11/11/2020 |
| <ol style="list-style-type: none"> 1. Information provided for establishment and description of baseline in Section B.4 mentions the project activity as Solar Project instead of Wind Power Project. 2. In section B.6.4, the end date of crediting period is incorrect. PP is requested to revise it. | | | | |
| Project participant response | | | | Date: 24/11/2020 |
| <ol style="list-style-type: none"> 4. Section B.4 of PDD is revised with mention of wind Project activity. Typo error is corrected. 5. Section B.6.4 of PDD has mentioned note below table "Year 1 represents first year of second crediting period (1 December 2020 to 30 November 2021) and similar approach follows for subsequent years." There is no mention of end date of crediting period. | | | | |
| Documentation provided by project participant | | | | |
| Revised PDD Version 04 dated 24/11/2020 | | | | |
| DOE assessment | | | | Date: 26/11/2020 |
| <ol style="list-style-type: none"> 1. The PP has fixed the typo error and replaced the wind project by solar project in the revised PDD, Ver. 4.0 dated 24/11/2020. Comment closed. 2. The asterisk placed in the table by the PP in the revised PDD, Ver. 4.0 dated 24/11/2020 provided clarity on the crediting period. Comment closed. | | | | |

| | | | | |
|--|-----------|--------------------|----------------------|-------------------------|
| CAR ID | 03 | Section no. | D.1 & D.2 | Date: 11/11/2020 |
| 6. In section D.1 and D.2, name of host country DNA incorrect 7. In section D.2, PP shall refer latest EIA notification and provide the supporting evidence in the footnote. | | | | |
| Project participant response | | | | Date: 24/11/2020 |
| 8. Section D.1 and D.2 clearly mentioned host country DNA name 9. Section D.2 revised with latest EIA notification amendments. EIA is not required for wind projects | | | | |
| Documentation provided by project participant | | | | |
| Revised PDD Version 04 dated 24/11/2020 | | | | |
| DOE assessment | | | | Date: 26/11/2020 |
| 10. The PP has made a revision by adding the updated name of DNA India in the revised PDD, Ver. 4.0 dated 24/11/2020, found to be satisfactory, hence accepted. Comment closed. 11. A detailed justification as to how the project activity does not require undertaking environmental impact assessment (EIA) studies is provided by the PP along with weblinks to supporting documentation in sec. D.2 of the revised PDD, Ver. 4.0 dated 24/11/2020, found to be satisfactory, hence accepted. Comment closed. | | | | |

Table 3. FAR from this validation

| | | | | |
|--|----|--------------------|----|-------------------------|
| FAR ID | xx | Section no. | NA | Date: DD/MM/YYYY |
| Description of FAR | | | | |
| | | | | |
| Project participant response | | | | Date: DD/MM/YYYY |
| | | | | |
| Documentation provided by project participant | | | | |
| | | | | |
| DOE assessment | | | | Date: DD/MM/YYYY |
| | | | | |

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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 | | |